McGRAW-HILL INTERNATIONAL

Management Digest

TECHNICAL • INDUSTRIAL • COMMERCIAL

OCTOBER 1968

OVERSEAS EDITION

New Mitsui Empire:
The World Is Its Market Place—p1

MORE STEEL

Millions of additional tons from Bethlehem plants

So that more steel will be available to the industries of the world, Bethlehem is rapidly expanding the capacities of its plants in the United States of America.

For example, the great Sparrows Point Plant (world's largest steel plant on tidewater) now has an annual capacity greater by 2,000,000 tons than it had a few years ago. From this plant, in the Port of Baltimore, products for export distribution can be loaded directly on board ship.

Increased capacities mean that greater quantities of steel products will be available for the export markets. In addition, it means that Bethlehem's friendly offices and representatives throughout the world will be able to serve you better and more promptly than ever before. Bethlehem Steel Export Corporation, 25 Broadway, New York 4, U. S. A. Cables: "BETHLEHEM, NEWYORK."

Bethlehem supplies steel to world markets in all forms, including

BARS ★ ALLOY STEELS ★ TOOL STEELS
PLATES ★ STRUCTURAL SHAPES
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WIRE PRODUCTS ★ RODS ★ RAILS

★ BETHLEHEM STEEL ★

Offices and representatives in all principal cities of the world

704E

Tractor Methods Can Conserve the Soil

The soil is the most valuable natural resource in the world. It deserves the best care and management possible to prevent erosion and preserve fertility. No farm or nation has too much good land. The illustration above provides an excellent example of the value of soil conservation.

If sloping land in cultivated crops is left unprotected, fertility and top soil are lost through erosion. When crops are planted in curving contours and strips and safeguarded by terraces and other conservation measures, these losses are prevented. More abundant yields result and the income of the land owner is increased.

Modern tractors and implements make practical the soil conservation measures that prevent the loss of valuable topsoil and preserve fertility indefinitely. The photograph below illustrates how land can be plowed on the contour with modern equipment.

Allis-Chalmers manufactures a complete line of tractors and hydraulically controlled implements which simplify the practice of soil conservation. Consult the Allis-Chalmers dealer in your area for full information.

Allis-Chalmers WD-45 diesel tractor and 4-blade disc plow

Illustrated is an outstanding example of a modern agricultural tractor. It is available with a large assortment of implements which are easily and quickly mounted on the tractor, as needed, and in operation are hydraulically lifted, lowered and controlled. Equipment of this type enables farmers to grow better crops at lower cost. The Model WD-45 Tractor is available with diesel or carburetor type engines.

FARM EQUIPMENT DIVISION — DEPT. MH1055 — MILWAUKEE 1, U.S.A.

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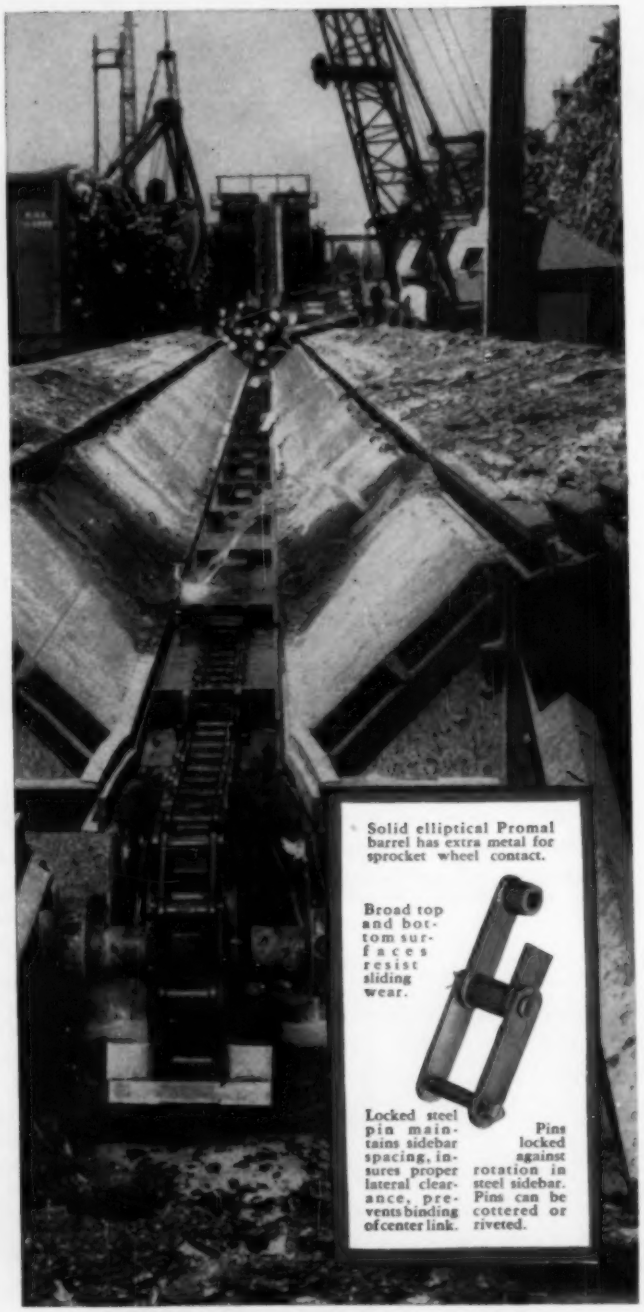
Solid elliptical Promal barrel has extra metal for sprocket wheel contact.
Broad top and bottom surfaces resist sliding wear.
Locked steel pin maintains sidebar spacing, insures proper lateral clearance, prevents binding of center link.
Pins locked against rotation in steel sidebar. Pins can be cottered or riveted.

Pulpwood conveyor employing C-132 Link-Belt file-hard Promal combination chain, with pusher attachment every 6 ft.

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Management Digest

Formerly McGraw-Hill DIGEST

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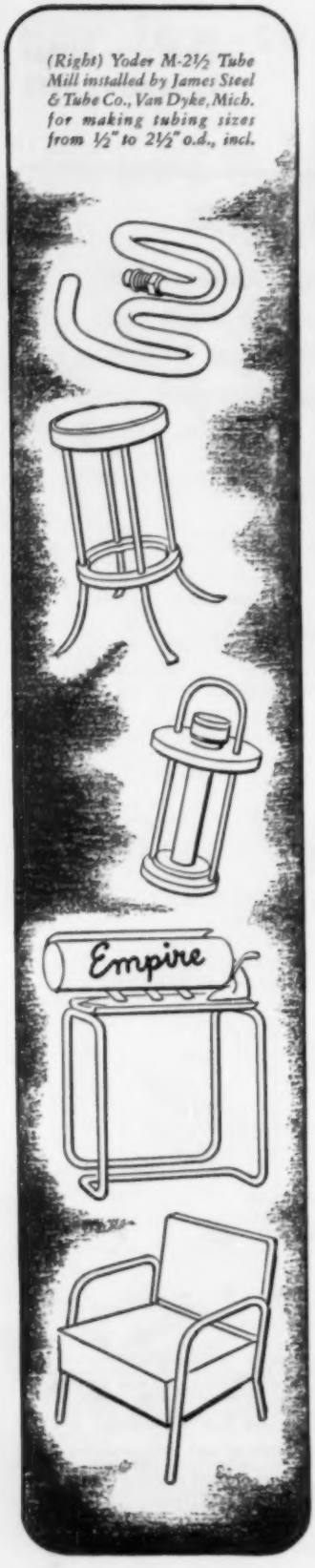
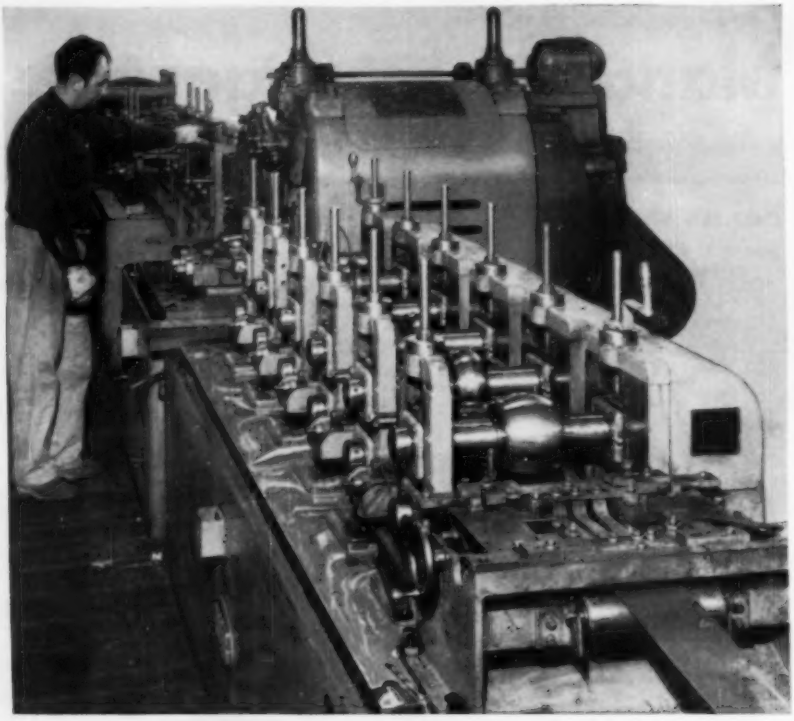


(Right) Yoder M-2½ Tube Mill installed by James Steel & Tube Co., Van Dyke, Mich. for making tubing sizes from ½" to 2½" o.d., incl.



Plain Facts about

ELECTRIC-WELD TUBE MANUFACTURE

In tube making everybody wants the highest possible speed consistent with good, strong welds and dimensional accuracy. There are, in addition, at least three more essentials to profitable tube making, namely:

1. Low scrap losses—because cost per foot of strip metal is many times greater than the conversion cost.
2. Fine exterior finish, free from scratches, scuff marks and other irregularities which limit usefulness and lower salability.
3. Quick and easy mounting and adjustment of tooling, to reduce time losses between successive production runs.

Yoder tube mills excel in all these respects and have other mechanical, electrical and economic advantages. Because Yoder tube mill owners have found from experience their performance is as good as our promise, there are more Yoder mills sold and in operation than all other electric-weld mills combined. This is as true today as it was ten years ago.

If you want the plain facts about the things to look for in a tube mill, to insure most profitable operation over the years, the new Yoder Tube Mill Book will give them to you, in the simplest language and with numerous illustrations.

A copy is yours for the asking.

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COLD ROLL FORMING PRODUCTION LINES

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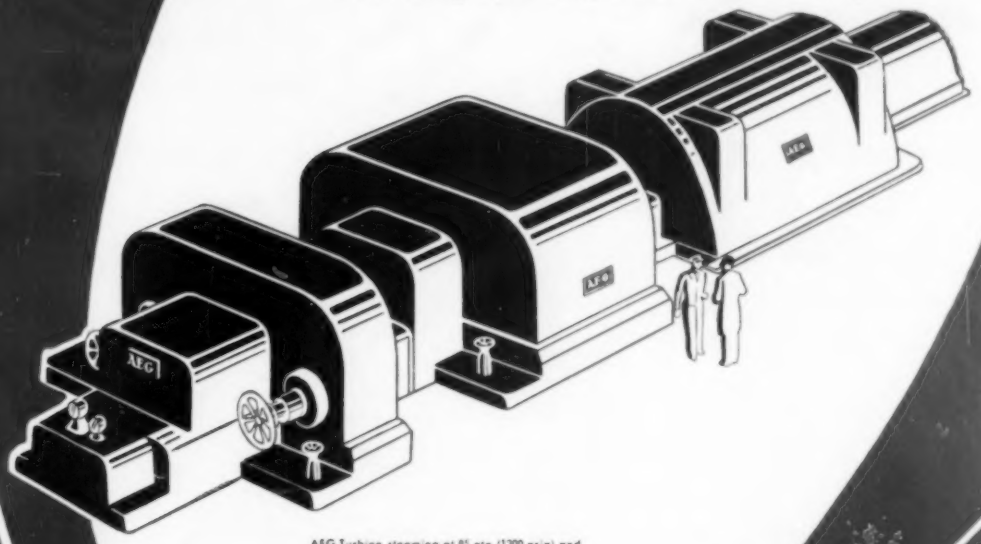
ENGINEERING

By 100,000 million kWh - units

rises the world's annual consumption of electrical energy. Six out of every ten units are generated in thermal power stations. The AEG has contributed a great deal to the development of generating sets for central stations.

AEG builds small, medium and large turbo-generators in ratings up to 100,000 kilowatts.



AEG-Turbine steaming at 85 atg (1200 psig) and 535° C (994° F), coupled to a hydrogen-cooled alternator of 50,000 kW output.

Technical literature is yours for the asking.

AEG means Electricity

You are invited to avail yourself of the manufacturing skill and experience of the AEG.

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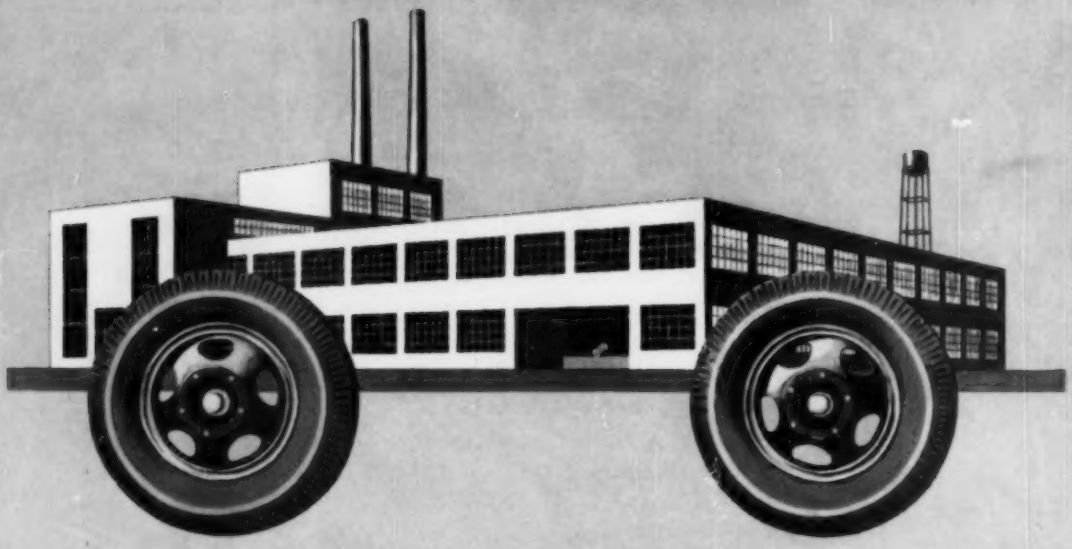

New plants aren't built on wheels

When building a new plant, site selection is one of the most important decisions you make before breaking ground. That is why the caliber of the firm you select to locate, engineer and construct your plant is so lastingly important.

The high quality of Ebasco construction—the integrity, skill and experience of Ebasco personnel—are evidenced in the more than two billion dollars of plants that Ebasco has engineered and constructed in its half-century of service to many different industries in many parts of the world.

If you would like to become better acquainted with Ebasco, write for our booklet, "The Inside Story of Outside Help", Ebasco Services Incorporated, Dept. A, Two Rector Street, New York 6, New York.

1905 *Fiftieth Anniversary* 1955

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New Bundy-engineered designs bring big cost-savings to refrigeration industry

Just one more example of how Bundy engineers help solve customers' design problems

Bundy engineers have come up with two important innovations in refrigeration design—a unique tubing strainer design and new "square end" coils. These important Bundy "firsts" are typical of the kind of help *you* can expect from Bundy in the design stage of a new product.

Check first with Bundy when you're faced with a tubing problem, whether your product is in the design, development, or application stage. It's highly likely that Bundy and its staff of engineering experts can give you an inexpensive, workable solution in a hurry.

Find out, too, about the high quality of Bundyweld Tubing. Remember, Bundyweld is the only tubing that is double-walled, thinner walled, yet stronger. It has high thermal conductivity, high bursting strength, is leakproof, and takes easily to standard fabrication operations. Long the safety standard of the refrigeration industry, Bundyweld is also used *in 95% of today's cars, in an average of 20 applications each!*

For information on Bundyweld, and on Bundy's engineering services, call, write, or wire, today!

BUNDY TUBING COMPANY
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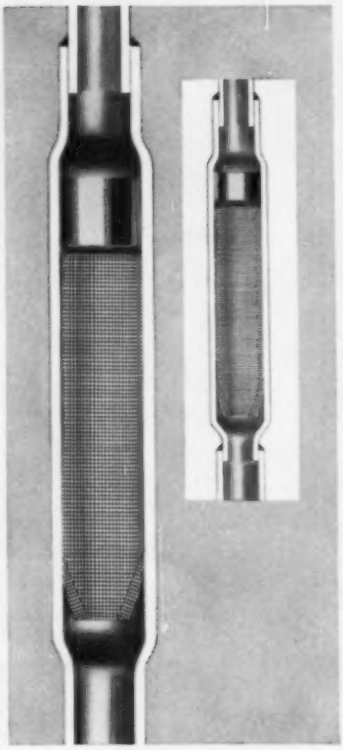
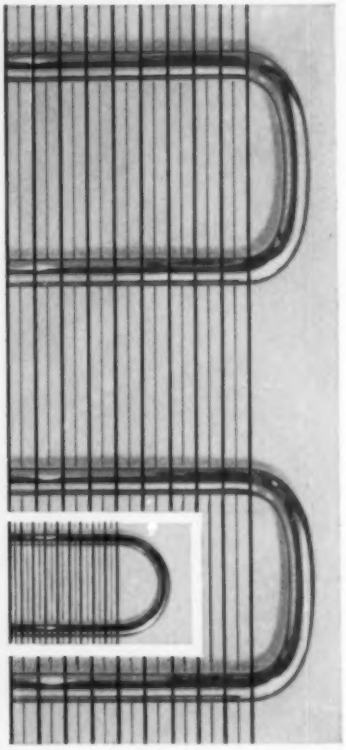


Strainer design: New Bundy design actually makes tubular strainer an integral part of condenser coil. The coil end is expanded to receive the strainer and then swaged down to capillary size. This ingenious design eliminated one solder joint (see inset of old-type strainer) with its consequent risk of leakage or dirt inclusions; resulted in a costsavings of 50% to the customer.



New "square end" coil: New Bundyweld condenser coil design has all the advantages of regular coil (see inset), plus an important extra! Square bends allow up to six additional cooling wires to be attached automatically to the tubing, using the same spacing. This can appreciably increase actual cooling area, permitting more compact refrigerator designs.

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . .
continuously rolled twice around laterally into a tube of uniform thickness,
and passed through a furnace. Copper coating fuses with steel. Result
Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

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Leakproof
High thermal conductivity
High bursting point
High endurance limit
Extra-strong
Ductile
Lightweight
Machines easily
Takes plastic coating
Takes plating
Shock-resistant
No inside bead
Uniform I.D., O.D.

WORLD TRENDS

WORLDWIDE . . .

International trade will expand steadily during the next five years—at least. That conclusion can readily be drawn from recent United Nations reports. In 1954 world trade topped by 10% the previous peak reached in '53. The gain in 1955—over '54—will be about 7%.

Increases in national output in Western Europe, Latin America, the Middle East, and Africa have been largely responsible for the uptrend.

For the future—especially to bolster underdeveloped countries—the U.N. recommends: (1) that multiple currency systems and restrictive trade regulations be discarded; (2) that trade between Asia and the West be expanded (with emphasis on the point that a revived Latin American-Asiatic trade is an important new factor); (3) that the world's banking facilities be mobilized to extend the volume of export credit.

LATIN AMERICA . . .

Central and South Americans are buying more and more in Europe and Japan—at the expense of U. S. business. In 1950, Latin America gave 62% of its overseas business to U. S. companies. In 1954, the U. S. share fell to 56.7%. The trend continues.

Europeans and Japanese have been offering—to Latin America—low prices, liberal credit, and favorable bilateral barter agreements. U. S. business has finally started to respond with stepped-up salesmanship and better financing—but with no effective result seen, as yet.

WEST GERMANY . . .

The economy is humming along these days like a well-oiled machine—like a Volkswagen! Economic progress surely will continue for the rest of this year—in fact, for the foreseeable future. Gross national product for 1955 will be 10 to 12% higher than in '54. There is some threat of inflation (see Finance)—but Bonn should be able to take care of that.

The steel, automotive, and chemical industries are showing steady expansion and growth. For example, in the automotive field, demand is far ahead of supply. Volkswagen officials estimate they will be able to deliver only 35,000 of the 70,000 cars now on order in the United States.

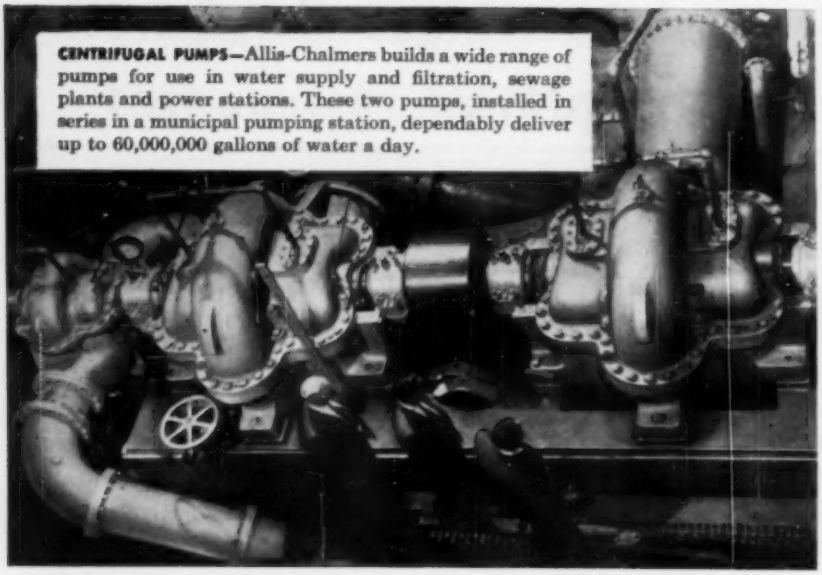
Two long-term projects are getting much attention and represent a trend in German industry: (1) automation—to meet the threat of short labor supply in many industries, and (2) peaceful uses of atomic energy—to meet the threat of a coal shortage in the next few years.

UNITED STATES . . .

Washington will submit 500 items for lower-tariff discussions—in the hope of negotiating mutual concessions—at an important tariff conference to take place early in '56. The meeting will probably be held in Geneva before February.

A liberal world trade policy, with the trend toward lower tariffs and fewer restrictions, is still the approach of the Administration—this in spite of recent U. S. tariff increases on bicycles and expensive watches. These were isolated incidents.

U. S. Government officials believe they will be able to agree on lower duties for at least 300 items.

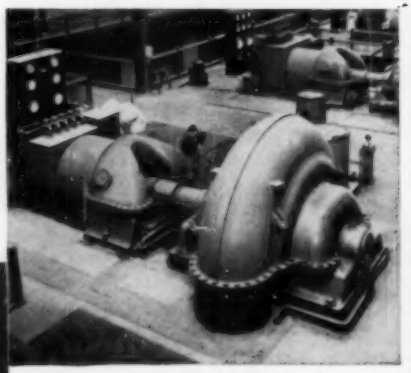


CENTRIFUGAL PUMPS—Allis-Chalmers builds a wide range of pumps for use in water supply and filtration, sewage plants and power stations. These two pumps, installed in series in a municipal pumping station, dependably deliver up to 60,000,000 gallons of water a day.

Helping public works improve service and cut costs . . .

For more than 50 years, Allis-Chalmers has been a leading supplier to public works projects all over the world. Here are examples of modern A-C equipment and how it works for the public's benefit.

BLOWERS, TURBINES, CONDENSERS—This modern municipal plant converts sewage into fertilizer which is sold commercially. The blowers (among the world's largest for this type of operation) plus the turbines and condensers were built by Allis-Chalmers.



SYNCHRONOUS MOTORS—For dependable, low maintenance operation, this pumping station relies on three sets of Allis-Chalmers motors and pumps. Each of the synchronous-type motors delivers 4,300 horsepower.

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McGRAW-HILL INTERNATIONAL

Management Digest

OCTOBER 1955
VOL. 10—NO. 10

In Japan, a new trading power is rising from the ashes of an old regime. It is Daiichi Bussan Kaisha, principal successor to the giant Mitsui cartel that was broken up by U.S. Occupation officials.

MITSUI EXECUTIVES are busy with expansion plans—big plans. Company directors are all active members of management.

Mitsui Rebuilds Its Empire

Digested from BUSINESS WEEK, Aug 13, p62

Stockholders of Tokyo's Daiichi Bussan Kaisha, Japan's largest trading company, were called upon recently to approve another name for the firm—Shin (New) Mitsui Bussan Kaisha. The new name, to be known abroad simply as Mitsui Trading Co., expresses the new character of the organization.

About 3 months ago, the firm merged with two other companies that—like itself—were once part of the giant Mitsui industrial combine. Indication is that such mergers will continue—probably not so many as to restore Mitsui to its old prewar glory, but surely enough to give the name a new meaning of power and prestige throughout postwar Japan.

Three important pressures are behind the revival of Mitsui and the current trend toward "bigness" throughout Japanese industry: (1) an extreme shortage of working capital for small companies, (2) the inexperience of small companies in marketing at home and abroad, and (3) a general nation-wide reaction to the Occupation and the splintering of industry that occurred under it.

The Japanese government has shown itself to be much in favor of the reversal back to prewar methods of doing business. The government feels that Japan can regain its foothold in world commerce only through the operations of large companies. It recently rescinded most of the anti-monopoly legislation enacted during the U.S. Occupation.

That the government will assist Mitsui and similar groups—in very practical ways—there is little doubt. For example, because of its size, the merged Mitsui company is now entitled to receive loans from the government's Bank of Japan at special low rates.

Mitsui operations are already quite extensive. It trades in 30 countries, handles more than 1,000 products for export, and imports more than 400 products. It controls 40 small industrial corporations in Japan. The company's total monthly turnover is $56-million. This is 30% more than in 1954 and 90% over 1950. Of this total business, 56% is done in overseas markets.

RAW SILK at Yokohama: Mitsui introduced silkworm to Japan from Italy.

COMMERCIAL EXHIBITS in Geneva, like this one of Westinghouse Electric who made the first export sale of an atomic power plant, offered . . .

Atoms for Sale

Digested from THE ECONOMIST (London), Aug 13, p561

Early in August in the garden of the Palais des Nations in Geneva, to the left of the entrance, was a summer house almost entirely filled by a circular dais. Below a round sheet of glass set into the floor, and submerged in 22 feet of water, was a small working atomic reactor.

Occasionally a bubble came to the surface. There was no sound, no other movement—nothing but the recording instruments to show that a reaction was taking place.

The reactor, the official U. S. exhibit, was small, possibly not much more than a laboratory toy. But it was the first time any such plant had been publicly displayed.

That was the keynote of the conference. A great many facts that had until then been secret were revealed.

The participating countries, especially Britain, Russia, and the U. S., were playing for high stakes —for atomic leadership, political influence, economic reward.

No startling scientific revelations were made. The one sensation was the appearance of hydrogen fusion as a possible source of power. Press conferences and corridor conversations centered on this fascinating possibility.

At the conference, these things were evident: No one country was able to demonstrate conclusively that it was technically ahead of its atomic competitors. Approaches varied but the scientists of different countries, working independently, had arrived at practically the same conclusions.

The chief interest of the delegates was atomic power—the need for it, the cost of it, and the methods of obtaining it. Both the British and Russians believe that atomic power is nearly here.

A Russian reactor of 5,000 kilowatts was described as a prototype, with a 100,000-kilowatt station to follow it. The British are moving rapidly, pointing research efforts to the possible use of thorium in reactors.

The Americans, on the other hand, believe atomic power is still distant commercially. They are concentrating on testing a number of experimental reactors.

The maneuvering at Geneva certainly had great importance in setting the environment in which atomic trade is likely to be carried out during the next decade. But overshadowing the commercial aspects was the fact that, for the first time since 1939, atomic scientists met and talked with a real degree of freedom.

Steel Supply Lags...

. . . behind its worldwide demand, despite expansion in capacity in many countries

Digested from AMERICAN LETTER, Aug 6

Steel consumption is booming around the globe. Major producers, including Britain and Germany, are raising capacity. U. S. steel makers, despite previous estimates that capacity would be more than enough for the next 5 years, again feel the need for expansion. Less industrialized countries are investing heavily in steel output. But the worldwide outlook is for a continued tight supply situation and higher prices.

In Europe, German demand and capacity are growing. Orders are running 30 to 40% ahead of a year ago. Repeated British purchases from Japan give a clue to impending European shortages.

In the Far East, India's 5-year plan to increase capacity to 6½-million tons will lead to greater demand as secondary industries multiply.

In Latin America, steel output will double in the next 4 years. Capacity of 14 integrated plants in seven countries will total 3½-million tons, compared to 1.9-million tons last year. But experts feel demand will grow faster.

New

U. S. consumers will keep on buying—that is what the University of Michigan's latest survey of consumer attitudes and intentions shows. As of June, they planned to buy more houses and as many automobiles and household appliances this year as they did a year before.

But a note of caution entered. Although the index of consumer confidence is still rising, it is doing so at a slower pace. Most people feel that prices are heading upward.

Digested from BUSINESS WEEK, Aug 6, p42

Management Executive
Engineer
Research Worker
Technician
Plant Supervisor
Foreman
Production Worker
Sales Manager
Salesman
Office Manager
Office Worker
Creative Thinking Produces
PRODUCT IDEA!
. . . Add A New Item . . . (or drop an old one from the catalog . . .)
PRODUCT POLICY
. . . profit-wise test by which management evaluates the new idea . . . is based on at least 10 major economic factors . . . Instead of hit-or-miss, you use a Policy Formula for making . . .

Safe Product-Line Decisions

Digested from HARVARD BUSINESS REVIEW, July-Aug, p91

The original idea for a profitable new product may come from the company president—or from the third-assistant machine oiler in the grinding department! There is simply no set rule about the origin of good product ideas and no limit on the number of these that come to the attention of top management.

At least, there should be no strict limit imposed. Alert management encourages creative and original thinking on the part of all employees—the problem, then, is how to sift out the good ideas from the bad.

Some executives have developed formal policy formulas for testing product suggestions. Those businessmen believe that carefully planned, specific standards must be applied when it comes to deciding whether a new product should be placed on the market. Too much money is at stake, they say, to rely on rule-of-thumb methods.

Whether an old product should be dropped, or a component part bought or manufactured—these are related decisions that, quite logically, are decided by the same over-all "product policy."

Advantages—A formal product policy, in addition to providing management with a sound guide for its own product decisions, serves three additional functions:

1. It tells lower management, engineers, and researchers exactly what information is needed by top management before a final product decision can be made. Also, it provides a convenient framework, or formula, around which this information can be organized.

2. It provides an additional and reasonably accurate way to check on estimates concerning profit and loss. Market research, sales forecasting, and cost estimating are valuable aids, but they provide only approximations.

3. It guides and ties together the activities of all departments concerned with a product decision—research, development, engineering, manufacturing, marketing, legal, financial, personnel.

Resources—The first step in arriving at a product policy is to take a careful inventory of the company's resources. Every business organization—whether it be a steel mill in Italy or a coffee mill in Brazil—is best equipped to perform only certain services or to produce only certain products. Product policy is a formal recognition of both abilities and limitations. It is a safeguard.

The inventory of resources should include a close analysis of:

- Financial strength.
- Raw materials.
- Production facilities.
- Plant location.
- Patents owned or available.
- Public acceptance.
- Established dealers.
- Marketing contracts.
- Specialized experience.
- Skilled and unskilled workers.
- Management's abilities.

A careful review of all these resources—plus any special ones that the company may enjoy—will establish the basic facts from which a policy can be developed.

Developing the Policy—Next step, of course, is to compose the policy formula. It should cover all important economic factors that enter into a typical product-line decision. There are at least ten major points—for "testing" a new-product idea—to include:

1. A statement on capital investment in new-product ventures

ought to head the list. How much could be safely invested in a product that would produce XXX volume of sales? How much could be put into a product that would produce only XX volume? How long could the company afford to sustain operating losses on the product?

2. A statement of sales-volume policy might well be next. What level of sales can best be handled, considering the company's manufacturing and marketing facilities?

3. Statement on distribution: What type of product is the sales force trained to handle? What type will be acceptable to established wholesalers and dealers?

4. Present product line: What kinds of products would conflict? What kinds would have a good effect? Will products that compete ever be permitted?

5. Competition: What is the company's competitive position with respect to major types of products?

6. Cyclical stability: Can the company handle seasonal products? What are the requirements?

7. Technical opportunity: Must a new product represent a technical advancement? What are the purely technical standards?

8. Patent protection; legality: Must the new product be patentable? Must it be free of special government regulation? What about license requirements?

9. Raw materials: What limitations does the company impose concerning types of material that may be used in new products? How about storage and handling?

10. Manufacturing load: Must the new product be one that can be produced by mass production methods? What special employee skills are available? What about grades and sizes?

Your Policy—Even the briefest review shows beyond doubt that your product policy may be nearly opposite to that of your closest competitor. It is a question of highly individual company requirements and circumstances. Whatever policy is finally adopted, it should be reduced to writing—in simple clear-cut terms—and made available to all employees.

Your Training Program . . . Does It Do the Job?

Digested from PERSONNEL, July, p16

Elaborate training programs for foreman and "middle-management" executives are widely used in industry today. A great many companies spend a lot of time and energy—and money—in setting up special "in-plant" courses of instruction. Young men with talent and ambition are groomed for supervisory jobs. Older men, who have proved themselves as minor supervisors, are given the chance to prepare for still higher positions.

But just how effective are these efforts? Does management really know whether its expensive company training is producing the best possible result?

Procter and Gamble Co. (Cincinnati, Ohio), soap makers with a worldwide business, have devised a practical method to test the effectiveness of management training.

The procedure was first applied by P&G to the training of new foremen. It has since been used successfully for higher management positions and for staff technicians. This is how it works:

• **The Evaluation**—A promising man, call him Able, is selected for foreman training. He undergoes several months of intensive instruction—group meetings, individual coaching, lectures, on-the-job practice, etc. He is assigned to his new position as soon as formal training is completed and during the next few months is closely guided and coached by his supervisor.

After working at the foreman's job 6 months (more or less), Able is "tested" to determine how effectively the training courses prepared him for the duties of foreman.

First, Able is carefully interviewed by a trained member of the industrial relations division at P&G. The interview takes about 90 minutes. He is asked a wide range of questions that reveal his ability to grasp the training program and put it to practical use on the job. He is asked, quite frankly, for suggestions on how to improve training methods. This is strictly a double-check on training—not a check on the man himself. (The point is carefully explained.)

Next, the department supervisor who led Able through his difficult early period is interviewed, fully and as candidly as possible. Again the spirit and purpose of the interview are to reveal weaknesses in the training program—not weaknesses in Able as an individual.

A complete report is then drawn up by the industrial relations staff, including the factory training engineer—the man directly responsible for all in-plant education. The report is directed to higher management for review and possible revision of methods.

• **Results of Evaluation**—Procter and Gamble see three chief results, assuming the method is thoughtfully carried out and that a sizable number of training reports are completed each year.

1. A list of factors that influence the effectiveness of in-plant training, generally, is developed. For example, P&G discovered that "learning by doing" is much more effective in industry than learning by reading or learning from lectures. It was found also that training results were improved when the student was shown how the training project could be applied to his future job—in a simple, practical manner.

2. A clear picture of the status of training in all departments is developed. This enables comparisons between departments (or factories, as in the case of P&G).

3. Members of middle management become aware of training problems and learn how their operations can be improved by better training methods. Training in the plant becomes an active and ever-changing program—not dull and passive and retarded, as is too often the case in industry.

For maximum efficiency . . . for the best possible results . . . it is an established fact that . . .

You Need a Healthy Workforce

Digested from AMERICAN BUSINESS, July, p12

An improved medical and health service for employees is an example of how to spend money in order to make money. That is the opinion of management at the Corn Products Refining Co. (New York).

CPR has discovered that in-plant medical service—if operated in an efficient, modern manner—pays for itself many times over. It reduces lateness and absenteeism, improves worker health and morale, cuts sick-leave expense, and improves employee relations. CPR—with new up-to-date facilities in all of its four manufacturing plants—has become a leader among concerns that are active in industrial medicine.

Everything needed for emergency first aid and on-the-job treatment is contained in CPR's newly expanded medical facilities. Primary function of these departments is the treatment of cuts, burns, and bruises. But the company feels that their greatest contribution, eventually, will be in helping employees safeguard their own health through careful diagnosis and referral to family doctors.

CPR employees have already learned to appreciate the company's "preventive medicine philosophy" that underlies the entire program. The workers have responded enthusiastically to the idea of treating minor injuries before they become major.

Annual health examinations are given to all executives and key men. The company thus protects its investment in highly trained personnel. Rank-and-file workers have the advantage of periodic examinations at only one of the four CPR plants—the others, however, are planning similar programs.

The largest CPR plant employs 3,300 workers (Argo, Illinois). There the medical staff consists of one full-time doctor, one part-time doctor, six registered nurses, and one laboratory technician. Argo workers call on their medical department to the extent of about 35,000 visits a year! Roughly the same medical facilities are available at all four CPR plants.

The most modern CPR medical setup is at Argo. The department there is located in a two-story medical-personnel building. It includes an emergency operating room, a clinical laboratory, X-ray equipment, a sterilizing and utility room, a doctor's office and examining room, dressing rooms, treatment rooms, nurses rooms, and a bedroom for seriously ill patients.

The modern building is air conditioned throughout. It has Thermopane glass windows with a double glaze to reduce the air-conditioning load. Medical rooms have terrazzo floors, and the walls are covered with ceramic glazed tile. A special ceiling deadens noises. Fluorescent lights are flush-mounted with the ceiling.

At the CPR plant in North Kansas City, Missouri, one of the first problems was to find a good location for the new medical department. This was solved by remodeling an old building that had been used for storage purposes. Windows were relocated for privacy. Walls were finished with ceramic tiles, ceilings with acoustical tiles, floors with resilient asphalt tiles.

There is an ever-widening interest on the part of businessmen in all aspects of employee medical service. This interest goes far beyond mere accident treatment. It includes not only periodic health examination — as indicated — but also, health education for the average working man.

Corn Products Refining intends to remain a leader in this area—well aware of the fact that the good health of its employees is an important company asset.

Selling Your Ideas

If you have trouble selling ideas to your superiors, these tips may prove useful

Digested from OIL & GAS JOURNAL, Aug 1, p95

Have you ever developed a good idea that would have helped your company—only to see it die before it had a chance to be tried? So it might have been the fault of your company management, even its board of directors. Or might it have been the fault of poor communication on your part?

To get positive action on an idea, you have to make sure that the right people understand it, realize its value, believe that it is workable. In other words, you have to sell your ideas.

The direct, forceful way to express ideas is illustrated oral presentation. That means you have to analyze the idea, find out whether it's workable, practical, and profitable, then organize your talk in terms of the interests of those who must evaluate it.

Begin organizing your talk by reducing the idea to its simplest terms. If your idea was conceived as the solution to a problem, use the "problem-solution-result" technique. Outline the problem, explain *thoroughly* the solution idea, then give the results.

Now illustrate your presentation by picking four to six points from your outline and illustrating them. These points should graphically summarize your idea, lend themselves to striking illustration.

Follow these seven basic tips:

1. Use only one illustration for one idea.
2. Use short, clear titles.
3. Use action verbs in titles.
4. Put motion into your illustrations.
5. Use bright colors simply.
6. Provide logical carryover from one illustration to the next.
7. Chose illustrations for variety.

At the end of your talk, be sure that the audience knows what action you want.

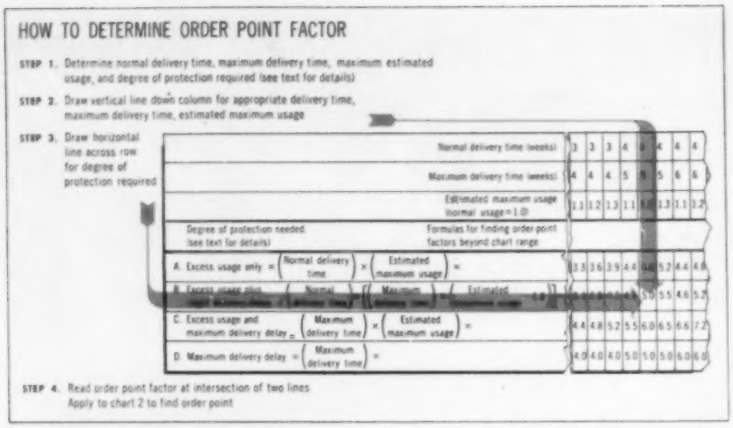

HOW TO DETERMINE ORDER POINT FACTOR
STEP 1. Determine normal delivery time, maximum delivery time, maximum estimated usage, and degree of protection required (see text for details)
STEP 2. Draw vertical line down column for appropriate delivery time, maximum delivery time, estimated maximum usage
STEP 3. Draw horizontal line across row for degree of protection required
Normal delivery time (weeks)
Maximum delivery time (weeks)
Estimated maximum usage (normal usage = 1.0)
Degree of protection needed (see text for details)
Formulas for finding order-point factors beyond chart range
A. Excess usage only = (Normal delivery time) × (Estimated maximum usage) =
B. Excess usage plus
C. Excess usage and maximum delivery delay = (Maximum delivery time) × (Estimated maximum usage) =
D. Maximum delivery delay = (Maximum delivery time) =
STEP 4. Read order point factor at intersection of two lines. Apply to chart 2 to find order point

TABLE TELLS you when and how much to re-order. It provides an accurate method proving that . . .

Inventory Control Works

Digested from FACTORY MANAGEMENT AND MAINTENANCE, Aug, p110

Inventory-control systems are usually based on fixed "order points." When the quantity of a stock item drops below a certain level, it is time to order more.

The trouble with this simple system is that the quantity is only correct when use of the item and incoming delivery of the item remain fairly constant. This they seldom do. Reynolds Metals Co. (Louisville, Ky.) has developed a unique control system to achieve a more balanced inventory.

New System—Three control factors are involved: (1) an estimate of actual current usage as compared with "normal" usage; (2) normal and maximum delivery times; and (3) varying degrees of protection against possible shortage.

Four degrees of protection are established—A, B, C, D (See chart):

A. Excess usage with normal delivery. Formula provides a quantity to cover maximum usage for period of normal delivery time.

B. Excess usage plus a slight delivery delay. Formula provides a quantity to cover normal usage for the normal delivery time, plus enough to cover excess usage (maximum less normal) for maximum delivery time.

C. Excess usage plus maximum delivery delay. Formula provides a quantity to cover maximum usage for maximum delivery time.

D. Maximum delivery delay only. Formula provides a quantity to cover normal usage for maximum delivery time.

How It Works—Here is a step-by-step example, using a Reynolds inventory-control card:

1. Determine normal and maximum delivery times for Item X. Suppose you know that the supplier will probably deliver in 4 weeks—but that he is sometimes 1 week late. Thus, 4 and 5 are your normal and maximum figures.

2. Estimate future maximum usage. Suppose your estimate is 20% above normal, or 1.2 times normal.

3. Refer to chart, above. Find the correct vertical column that combines your normal delivery time (4), maximum delivery time (5), and maximum usage (1.2)—indicated by vertical arrow.

4. Consider the degree of protection needed—listed as A, B, C, D on the bottom half of the chart. Suppose your research shows that you require degree "B". Intersect the two columns selected—at "5.0"—as shown with the arrows.

5. Multiply your "normal" weekly usage, say 5,000 pounds, by the order-point factor (5.0). This gives the order-point quantity, 25,000 pounds. An order should be placed to bring stock to that level.

Better Executive Thinking

Originality and imagination are golden assets to an executive . . . trouble is, they are too often buried by the pursuit of specialization and routine

Digested from HARVARD BUSINESS REVIEW, July-Aug, p121

The businessman who leaves creative thinking to the artist and philosopher is asking for trouble. He may be at the head of his business, but is apt to be a weak executive who fails to impress either his employees, his competitors, or his customers.

The top executive in a company —if he is alert—will attempt to nourish his own creative abilities and those of the key men in his organization. The truth is, the average executive has strong qualities of imagination and inventiveness. It is not a question of searching for genius, but rather one of encouraging and developing traits that most people possess—at least, most people who have risen to the executive level.

The creative forces in an organization need an atmosphere in which they may freely emerge and not be stifled. What can management do? Certain factors are important:

- The organization should give the individual free access to ideas —from superiors as well as from those on an equal level. There must be a fluid exchange of information throughout the company. Formal communication programs are not enough.
- As far as possible, the group make-up should be one that tends to bring together a variety of backgrounds and experiences. "New blood" from outside can help stimulate the organization toward richer achievment.
- The training of an executive, in addition to providing him with new skills, should enable him to understand his job in correct relation to the work and objectives of the total group.
- The "crash" or emergency approach to the solution of problems discourages creativity. It should not be applied as a regular technique for "getting things done."
- A group's attitude about the consequences of failure is a powerful element in determining creative potential. If the slogan of the business is "We don't tolerate mistakes," then many excellent ideas are apt to be left untried. Wise policy would seem to be to encourage venturesome thinking, realizing that the good ideas will contribute enough to outweigh greatly the cost of the bad ones. This means there must be "some room allowed" for failure.
- There may exist a certain bias in policy and procedure that will hinder creative thought. This arises frequently from the attitude "We have always done it that way—so it must be the right way!" The practice of questioning and doubting should be recognized. It is the duty of top executives not to protect or pamper established ideas.

Work pressure is closely related to the executive's ability to come up with that BIG IDEA! Creativity requires long, hard, and diligent preparation so that the mind is filled with material that is related to the solution. But the solution may not come as the result of long, hard, steady concentration.

Creative ability is apt to show itself most strongly when the mind and body are relaxed after a period of concentration on the problem. The subconscious mind works overtime. The ideal approach is to develop a good balance between work and relief from work in the executive group. A man's mind may make its most important creative contribution on the night when his briefcase full of work is left at the office.

Modern business practice demands specialization, systemization, and control. These elements are vital—but they must give way at some points to make room for creative thinking.

Quote of the Month

DWIGHT D. EISENHOWER
President of the United States

"The atom itself is non-political. It wears no nationality and recognizes no frontier. It is neither moral nor immoral. Only man's choice can make it good or evil."

New

Management consulting has developed into a major business in the U.S. Eugene Mapel, vice-president of a well-known consulting firm (Barrington, New York), gave these facts in a recent speech:

Gross billings of management consultants—who advise businessmen mostly on how to streamline managerial operations—will total $400-million this year. This is twice the size of the typewriter business in the U.S. and four times the size of the men's felt-hat business. There are 1,700 American consulting firms employing 44,000 people.

Meantime, many businessmen are going out to seek knowledge—instead of (or in addition to) calling in the experts. American Management Association has just announced that 5,000 executives will attend seminars at 350 management conferences between now and next June.

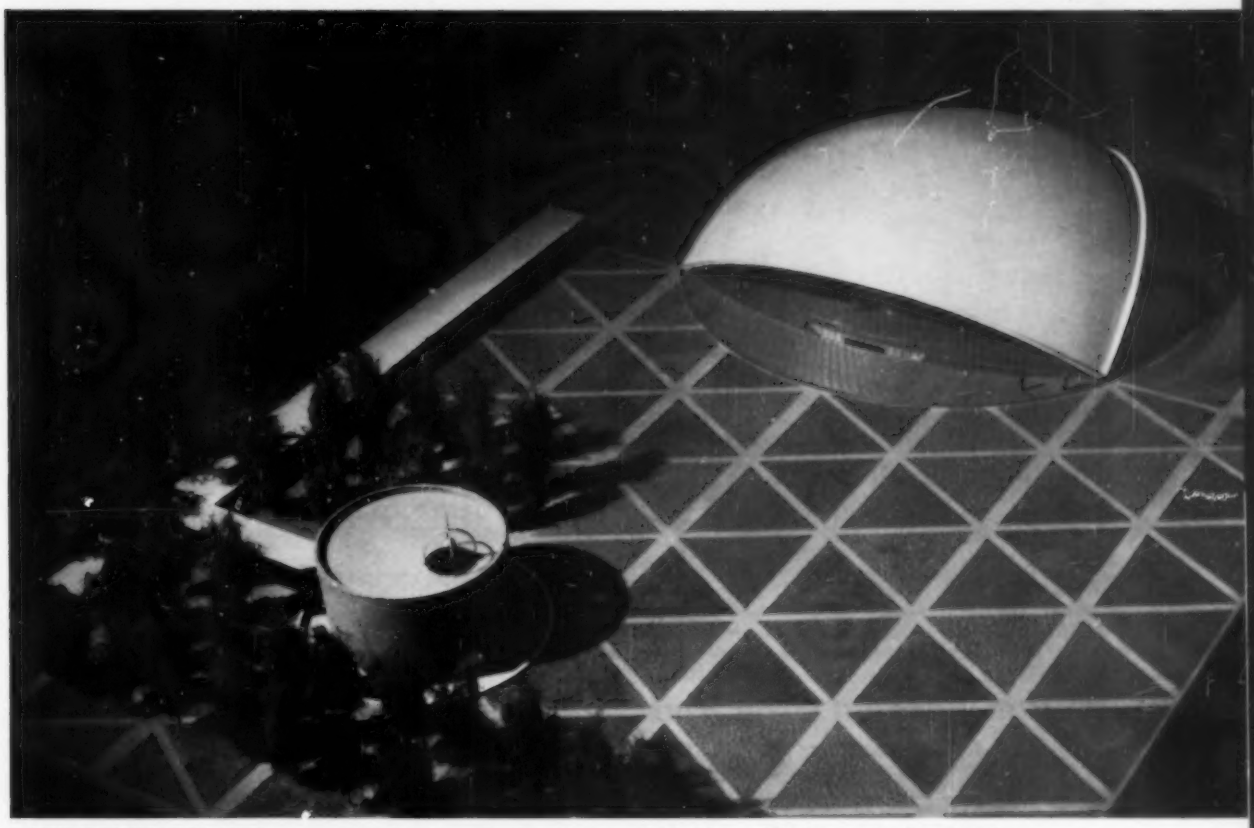
Digested from BUSINESS WEEK, Aug 6, p158; Aug 13, p45

INSIDE FOYER, arches loop to earth in a dramatic sweep. View through glass walls takes in MIT campus.

Dr. J. R. Killian, Jr., Massachusetts Institute of Technology president, dedicates Kresge Auditorium.

We Go Meeting Place

Digested from ARCHITECTURAL RECORD, July, p131



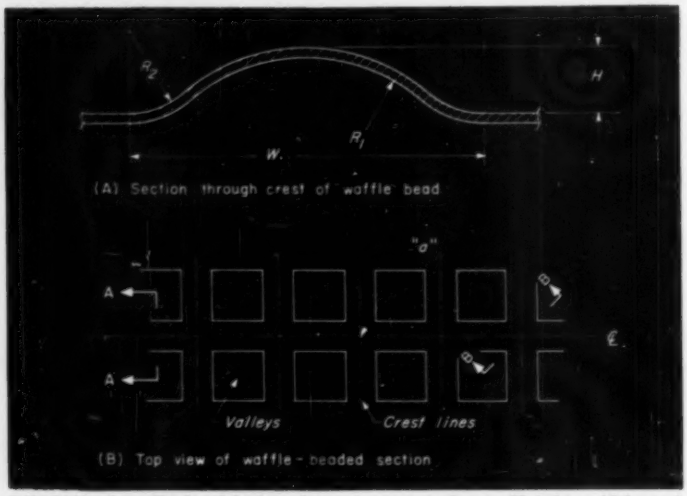
DOME DOMINATES MIT's new cultural center. In the foreground of this model rises a circular chapel.

AUDITORIUM is nearly perfect acoustically, seats 1,200.

OUTSIDE, structure presents striking curves.

to a Dedication: for the World's Engineers

WAFFLE BEADING in door gives high structural strength, low weight, low cost.



DESIGN of waffle bead is based on sine-wave shape. Height, width, and radii of the shape vary with requirements of the sheet-metal part.

"Waffle" Beading Gives You

Stronger Sheet-Metal Panels

Digested from PRODUCT ENGINEERING, Aug, p171

If you want a stronger sheet-metal structure, what do you do? First, you probably think of reinforcing members. Then when you find the cost and weight of such members, you may turn to beading as a means of stiffening the sheet-metal panels and making them stronger.

As you continue to study the problem, you will find that the most common beading stiffens the sheet metal in one direction only. That may be enough. But if you need greater strength in all directions, you can turn to waffle beading.

• **What It Does**—This type of beading increases both the flexural and torsional rigidity of an area. Intersecting sinusodially shaped beads (they actually look like a waffle's surface) are formed in the sheet-metal panel, which is spot-welded to a flat sheet.

The flat "skin" sheet is the tension member and generally is needed to improve the appearance of the part. No flat sheet is used where appearance is not important; the waffled sheet then provides bend strength with minimum weight.

What do waffle-beaded panels cost? The saving can be substantial. The aircraft landing-gear-strut door shown above cost only 35% of a conventional door reinforced with angles, gussets, and clips.

• **How to Waffle-Bead**—Waffles can be formed in sheet metal by press or drop hammer. Maximum panel size that can be formed is limited to the capacity of the press or hammer—usually 30x100 inches for hydraulic presses and 40x88 inches for hammers. As any number of "waffled" sheets can be spot-welded to flat sheets, fabricated panel size is limited only by maximum stock sheet sizes available. Waffle beads can be formed in most metals.

• **Design Factors** — Dimensions in the sine-wave shape vary with panel size, stiffness desired, and material. To avoid the fracture, the bead height should be chosen to give about 9% elongation of the metal. Points "a" (above illustration) are raised somewhat above other points on to crest wave to prevent fracture at these intersections. To get a strong bead pattern, section B-B must have the same ratio H/W as section A-A.

• **Waffle-Beading Variations**—When waffle beading does not provide great enough stiffness, it can be modified. One variation combines beading with use of stringers. First, extra-deep V beads are formed in flat sheet. Then the regular waffle pattern is formed.

Another variation is lattice beading. It gives three times the structural strength of waffle beading.

The lattice-panel pattern consists of uniformly spaced pyramidal shapes with spots flattened to provide surfaces for welding or riveting. A second panel is formed and placed upside down on the first panel in such a way that the peak of a pyramid always appears under a flat area. Spot welding the two panels and a plain sheet together makes a panel of limited section thickness and high strength.

Atomic-Energy Progress: Ideas for Your Industry

Digested from NUCLEONICS

The Geneva conference on atomic energy (page 12) drew the close attention of the entire business and industrial world. It did so because more and more the progressive businessman asks himself whether atomic energy will fit into his industry in his lifetime, whether he should now begin to think in terms of nuclear processes.

Here are a few ideas in different industries that indicate how widespread will be felt the effect of atomic energy.

• **Food Processing**—Many experts agree that the first use of radiation treatment in food processing will be to stop potato sprouting. Even so, encouraging results on irradiating potatoes to prevent storage loss have not yet enticed industry into development programs. A lot of test work must still be done to get government approval of its use in the U.S.

Treatment can stop sprouting for 18 months. Storage at room temperature is possible for long periods. The cost of irradiating potatoes would run about 1½¢ per pound.

Potato quality after treatment is considered acceptable. Professional taste panels of General Foods Corp. have been unable to detect any difference between treated and untreated potatoes. The U.S. government feels that extensive feeding tests are needed to prove their safety.—July, p15

• **Power Generation**—Announcements are coming rapidly in this field. One of the latest, from General Electric Co., is a proposal for a dual-cycle boiling-water reactor. It is believed that it can ultimately be produced at a cost comparable to that of a conventional steam-generating plant (about $170 per kilowatt) and generate competitive power.

The dual-cycle design would improve load-demand characteristics and permit much higher power. This would be done by using a flash tank to subcool the feedwater and by extending cooling channels to form "chimneys" and thus increase natural circulation.—July, p34

• **Metalworking**—Wear of steel extrusion dies can be measured and accurately located with a radioisotope technique developed at the Ecolo National Superieure des Mines (Paris, France).

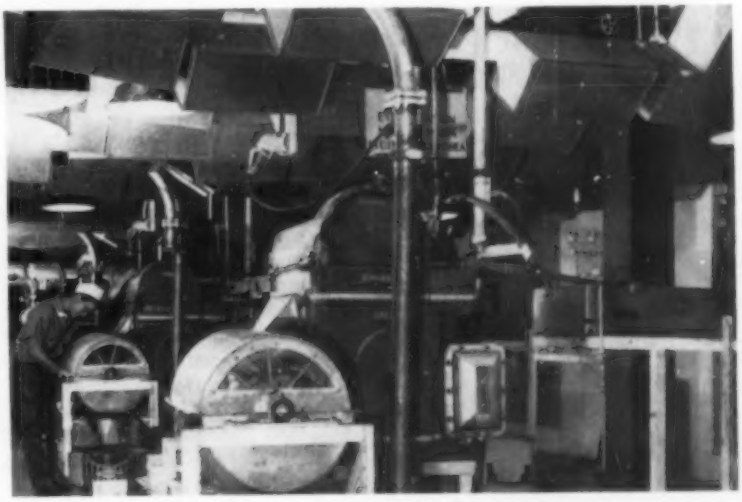
The die is placed in a vessel. A plug is inserted in its center, leaving a 0.05-centimeter annular space around the plug. Phosphorus-32 is packed into the space. After 1 hour at 95°C., plug and solution are removed. The die is lightly polished to remove the crumbly surface that formed.

Radioisotope absorption is measured along the die axis by a Geiger counter. Then, a 33-foot-long stainless-steel tube is extruded through the die. Counting is repeated. The decrease in radioactivity shows wear location. The total amount of metal removal agrees with that found by total-irradiation method—Aug, p 15

• **X-ray Inspection**—A new instrument, developed at the U.S. National Bureau of Standards, is potentially useful for both industrial quality control and research. It could be used, for example, to inspect large castings for flaws, a job commonly done with X-ray film.

But here is the big difference. The new instrument X-rays objects in motion.

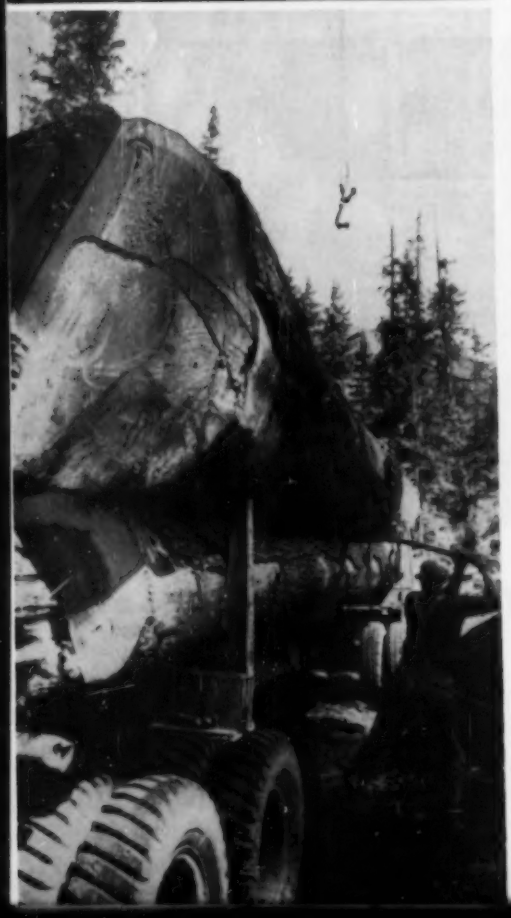
X-rays from a betatron pass through the object to be inspected, say an assembled compressor in operation. They enter a sodium iodide scintillation-crystal image converter and form a visible radiographic image. Light produced in the crystal is reflected into a television camera. The image then is displayed on a television receiver. A photographic plate holder can replace the television camera to furnish a permanent record.—Aug, p26



Digested from FACTORY MANAGEMENT AND MAINTENANCE, Aug, p74

Too Much Noise? Try "Soaking It Up"

The plastic-strand cutting room at Dow Chemical Co.'s Gales Ferry (Conn.) plant was sheer bedlam. Overall decibel reading was 107. Workers were bothered, production mistakes many. So plant engineers installed Sonosorbers, manufactured by Elof Hansson, Inc. (New York). They are diamond-shaped boxes, 12x12x14 inches, made of perforated aluminum skin with glass-fiber inserts. The result: 50% reduction in noise, as sensed by the average ear. Hearing loss is reduced, employee morale higher.



High Costs Spur Timber Industry to . . .

Make Each Tree Pay Its Way

Digested from BUSINESS WEEK, July 30, p102

The timber industry is not the same industry it was 50 to 75 years ago. For one thing, wood once meant lumber, but it no longer does. And mechanization has taken most of the hand labor out of felling and hauling trees.

What was once the lumber and sawmill industry has become the forest-products industry. Lumber is still being produced, and in substantial quantities. But producers are getting more and more of their income from other products taken from logs—products ranging from pulp and paper to particle boards and vanilla flavoring.

The 10 years since World War II have witnessed more expansion in forest products than has any like period in the last hundred years—particularly in the U. S. Pacific Northwest area.

Lumber has not gained much. The biggest gainers have been plywood and pulp. New products such as hardboard, ply-veneer, and particle boards are coming in fast—as well as specialty by-products such as cork from bark, and bark fractions for use in oil-well drilling muds.

The fundamental fact in the big change is that over the past 20 years timber has become scarce and costly—but especially during the postwar decade. As the price of timber goes up and up, you get economic pressure to find new products that will use every bit of the tree—and use it to the best possible advantage.

Wood utilization problems begin in the sawmill and plywood mill. Plywood recovers the highest values from the timber, so it gets the best logs available. Then lumber comes in—and to make the available wood go further, you have such tricks as gluing small pieces to make large ones and gluing lumber to make laminated beams of great strength.

The big problem is to use the waste material of the plywood and sawmill plants. The greatest progress so far has been in chipping this mill waste and converting it into a new raw material to feed the pulp and paper industry. Now a large share of wood requirements of pulp mills is being met by chipped wood waste from plywood and sawmill plants.

Another problem is what to do with the bark after you strip it from the tree. Thousands of tons of it have piled up. So far, most of it is burned for steam, but that is low-grade recovery.

Weyerhaeuser Timber Co. and Rayonier, Inc., have both developed uses for bark in oil-well drilling muds, and Weyerhaeuser can produce cork from fir bark that is refined for use in cork blocks and tile. But mountains of bark still remain. So emphasis is shifting toward chemical utilization of bark—learning how to break it down into its chemical constituents and then reform those chemicals into other products.

Timber-industry researchers feel the big future for wood is as a source of chemical raw materials. Lignin—the material that binds the cellulose fibers together in the tree—is coming in for some special and concentrated attention. Lignin makes up about 30% of the tree; it is separated out in the pulping process and, right now, is largely wasted—probably the most conspicuous area of waste still remaining in the forest-products industry. Its biggest outlet, so far, has been as a binder for highway materials. But even this is experimental.

Chemists know that lignin is a rich source of many chemicals. If they can get at these chemicals, then turn them into useful products, they can turn a material that is now waste into one of the highest valued parts of the tree.

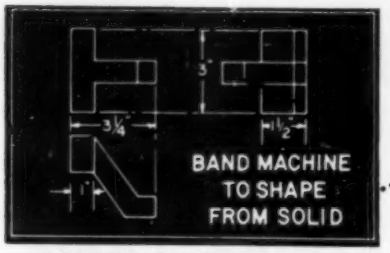
TREES are expensive. Most lumber producers use every splinter.

THESE LOGS may end up as lumber, plywood, newspaper—or flavoring.

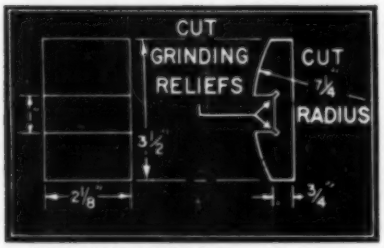
Cut Operating Costs with a DoALL

CONTOUR-MATIC

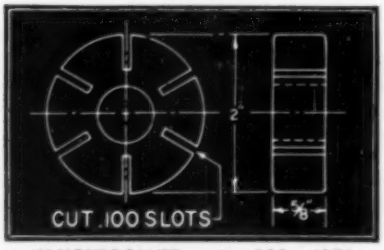
BAND MACHINE...



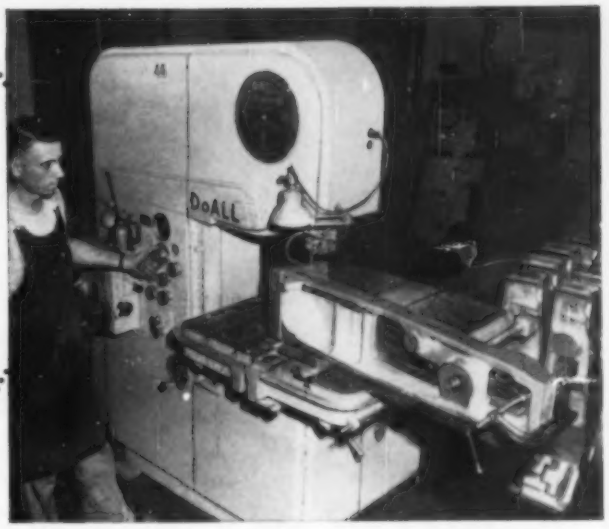
46.28 HOURS SAVED cutting mounting bracket from solid. 75 pieces formerly shaped in 60.00 hours, now band machined in 1.35 hours.



56% TIME SAVING in machining radius and grinding reliefs. 50 pieces formerly milled in 3.10 hours, now band machined in 1.35 hours.



48 HOURS SAVED cutting .100 x .4375 slots in rotors. 2000 formerly milled in 66.6 hours, now band machined in only 18.6 hours—72% less time.



New DoALL Contour-matic band machines have opened up an entirely new machining concept. An automatic hydraulic power feed table carries the work into the thin continuous-cutting band tool. Integral recirculating coolant system and air jet promote high cutting rates and long tool life. Cutting forces hold the work down to the table—only the simplest fixtures are required. Tooling cost is far less than for other machine tools. Setup and machining time is greatly reduced.

Faster cutting . . . lower tooling cost . . . lower capital investment (a DoALL power feed band machine costs but ⅕ to ½ as much as production milling machines, shapers or planers)—These are the money-saving advantages of DoALL *production band machining.*

For complete information, write:

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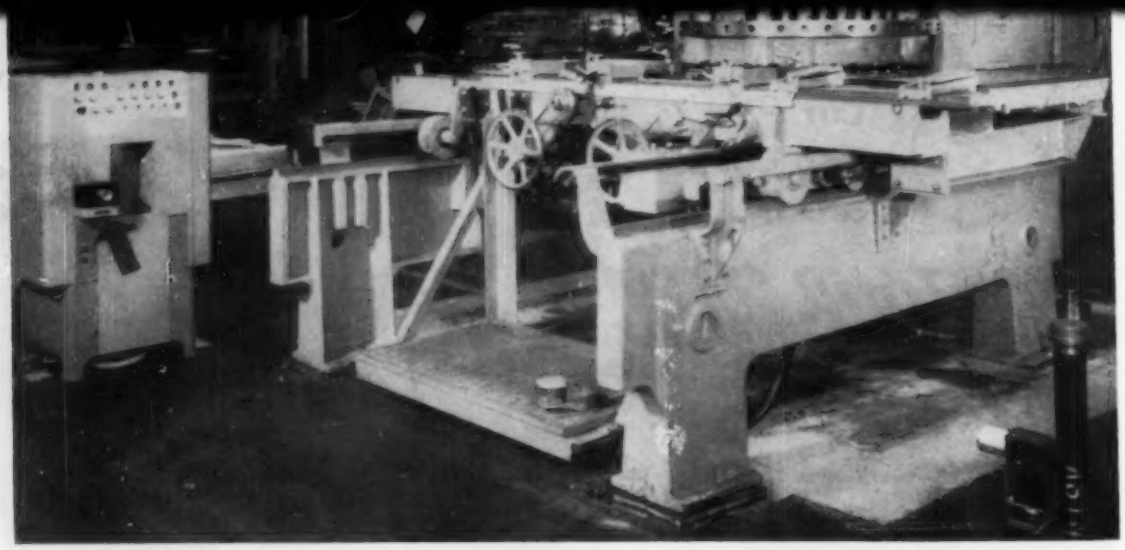


NUMERICAL CONTROL operates this Wiedemann turret punch press. Punched cards, stacked in director at left (arrow), control press motions. Holes of various shapes and sizes can be punched in metal sheets by rotating punch and die turrets to bring desired set into punched position. Two carriages move workpiece.

Punched Card and Plastic Tape Provide

Automatic Control for Machine Tools

Digested from AMERICAN MACHINIST, Aug 1, p102 & 106

What It Does

1. Operates machines faster, more accurately.

2. Provides flexible machine operation with minimum setup time between jobs.

3. Permits automatic machine cycles of complexity far greater than is possible by other means.

4. Eliminates drawings of many machine parts, yet stores the dimensions of these parts in numerical code.

5. Reduces the work of preparing machine instructions to a minimum of time and expense.

6. Increases machine productivity and reduces manufacturing costs.

7. Extends the field within which a given machine can be economically used.

8. Allows instructions to be used in identical machine tools in other plants. This method would make it possible to mail instructions instead of spare parts.

Automatic programming of two machine tools—a punch press by punched cards and a turret lathe by tape—increases greatly the productivity of these machines. Numerical control, as it is called, gives these machines (and others too, such as drilling machines, boring machines, cylindrical grinders) automatic operation equivalent to that of an automatic screw machine. This is done without the high expense of making, setting up, and storing cams and special templets.

You can readily understand the significance of numerical control by realizing that the term itself tells what it is—control exercised in accordance with numerical instructions.

Such instructions can be given in binary, decimal or other digital form on punched cards, punched tapes, or magnetic tapes. Essentially, they are instructions to the machine to select various mechanical operations or to position certain machine parts to specified locations.

• **Punched-Card Control**—Operation of the Wiedemann turret punch press is an excellent example of a not-too-complex, not-too-expensive system that has wide application. It positions the work, it selects and sets the tools, and it does the punching, all in a fraction of the time that would be needed for manual operation.

Punched cards, one card for each hole to be punched, are stacked in the director. General Electric engineers converted a Remington Rand card-reading-machine base to a director by adding a pushbutton control station and selsyn positioning mechanism.

The card reader feeds cards from a hopper into the card-reading pinbox, then out to the stacker. The card in the pinbox at the end of each card-feed cycle is probed by mechanical pins that push up through any punched holes in the card.

The director then passes the card information on to the punch press through a combination of multi-speed control transformers in the director and multi-speed selsyn generators in the position-indicating units. This system is essentially the same as that used by the armed services in military fire-control systems.

The information passed on to the positioning-indicating units causes them to locate the workpiece in the proper punching position by means of two carriages. The carriages carrying the work

move at right angles to each other. At the same time, a motor rotates the turret to bring the right punch into position.

The punch press, automatically operated, can process a piece in one-third the time required for manual operation. Time for a complete positioning and punching cycle varies from 2 to 8 seconds per hole, depending on the distance the work moves.

• **Plastic-Tape Control**—The Jones & Lamson No. 7A-2½ NC turret lathe is an experimental machine designed and built for numerical control by punched tape.

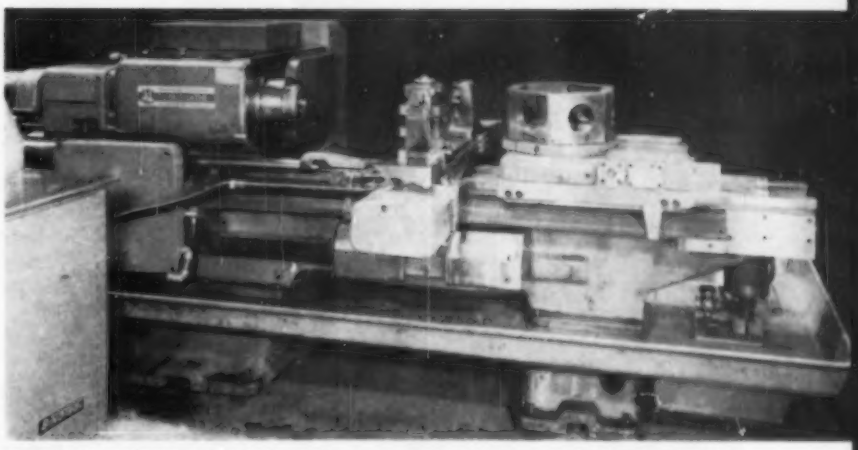
Its versatility leads J&L engineers to believe that numerical control will open new fields of application for turret lathes. Previous automatic turret lathes were too costly to set up for small production runs. But punched tape can provide automatic control economically on short runs. It's easily made and can be stored for future use.

The tape-controlled lathe cycles automatically and provides straightline motions with precise control at the end points of travel. All machine functions are tape-controlled.

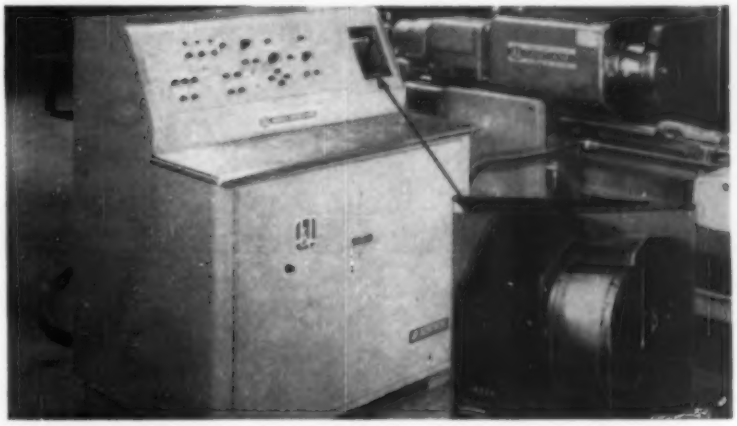
The punched tape uses a binary-number coding for best use of tape space available. The tape, mounted in the Binotrol control unit, is "read" by a tape recorder that makes electrical connections through the punched holes. Barnes Engineering Co. developed the control system.

The information is then compared to feedback return information from each leadscrew. A set of relays making up the comparison circuit interprets the results and sends orders to the motors that power the leadscrews, telling them in which direction to go.

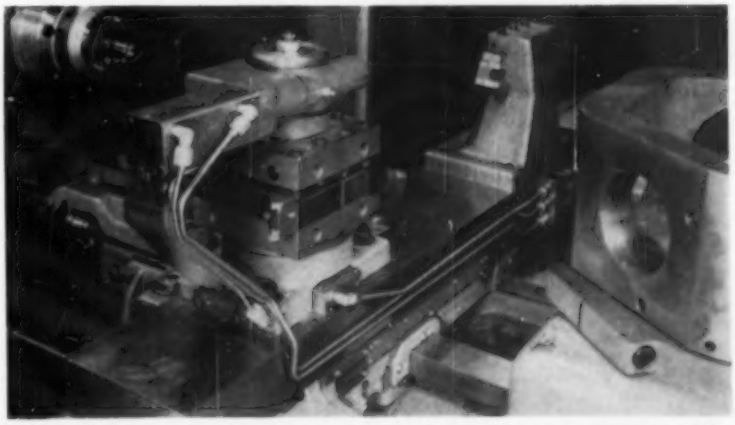
Flexibility of the lathe is excellent. Any order of instructions punched into the tape is executed by the machine in the same order. No cams are needed, no stops—just plug-in tools and the tape. Motions can be simultaneous or in sequence, whichever may be needed to give the best cycle pattern, and the most efficient operation of the machine.



NO HANDWHEELS is the first feature noted on this turret lathe. Automatic control eliminates need for handwheels and the operator fatigue they represent. The machine can be manually controlled by pushbuttons.



BINOTROL UNIT controls the turret lathe. The insert shows the punched tape looped in the tape reader. Information from the tape controls all leadscrew motions to within very close limits. Tapes can be reused.



FOUR-POSITION TURRET on cross-slide is indexed to any face by tape's hole pattern. Cross-slide travel is programmed in increments of 0.0005 inch. Tape will also park carriage under spindle nose for other operations.

Sweet, wholesome canned pineapple juice and pineapple slices come from the center of the fruit. But what happens to the skin?

Hawaiian Pineapple turned the peels into dollars by extracting the juice from these otherwise wasted materials. The juice is then clarified by two Oliver Vacuum Precoat Filters. The filtrate is further processed to obtain pure natural fruit sugar, and pure crystallized citric acid, which become end products that add to the profit.

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Fast Glass Mold Process Casts Metals, Cuts Rejects

Digested from CERAMIC INDUSTRY, Aug, p40

Development of a fast, economical method for the precision casting of metals with glass molds has been announced by Corning Glass Works (Corning, N. Y.).

The Corning Glascast process, designed especially for work with high-temperature alloys, assures an excellent surface finish and the tight dimensional control required in precision casting. Because molds can be used at extremely high temperatures, design of fine detail is possible.

The process eliminates the precoat step in investment casting. Rejects are cut because Glascast does not crack or spall.

Easy to work with, Corning Glascast powder is essentially a 96% pure silica glass that is mixed with water to produce a casting slip. Poured into a porous plaster form, the slip builds up into a Glascast shell that is dried, removed from the plaster, and fired. The mold is then ready for use without further treatment.

New

A magnetic-clutch power tool that torques screws and nuts within a tolerance range of 10% of pre-determined values has been put into production by Chicago Pneumatic Tool Co.

The new Magnamatic screwdriver does its job 24 times faster than the conventional method of partially tightening a fastener with a power tool, then applying correct torque with a torque wrench.

Probably the biggest benefit offered by the tool is that it takes the guesswork out of torquing fasteners with power tools. The Magnamatic stops once the desired torque is reached; it will not tighten the fastener further, regardless of how long the operator holds the tool on the screw. It permits desired torque to be applied consistently over high-production runs.

Digested from AVIATION WEEK, July 18, p52

▶ HOW TO . . .

. . . make a fireproof roof

A fire test at the Underwriters' Laboratories (Northbrook, Ill.) has provided some up-to-date information on the use of gypsum as a fire resistor.

Subject of the test was a 20x100-foot unprotected steel frame structure. The roof deck was a monolithic poured-in-place gypsum roof slab. This slab consisted of 2 inches of gypsum concrete, reinforced with wire mesh, poured over ½-inch- thick gypsum formboard resting on steel beams.

The slab was topped by a regular non-fireproof roof—made of asphalt-saturated felt, asphalt, insulation (½-inch layer), tar-saturated felt, pitch.

Gasoline jet burners were lit under the roof. The monolitic roof remained intact at 1700° F.

Digested from FACTORY MANAGEMENT & MAINTENANCE, August, p130

. . . flame-spray polyethylene

Flame-spraying polyethylene coating has been a ticklish job. Past practice has been to preheat the work to from 400° to 500°F., spray on powdered polyethylene, then bake the coating by flame. Control was difficult.

A new method uses Pyrothene, made by Pyrocote Chemicals, Inc. (Bayside, N. Y.). It's melted in special equipment, then sprayed as a liquid onto the work that is heated to 190°F. Finally, it's baked for bonding with the surface. The polyethylene coating is claimed to adhere better.

Digested from CHEMICAL ENGINEERING, Aug, p148

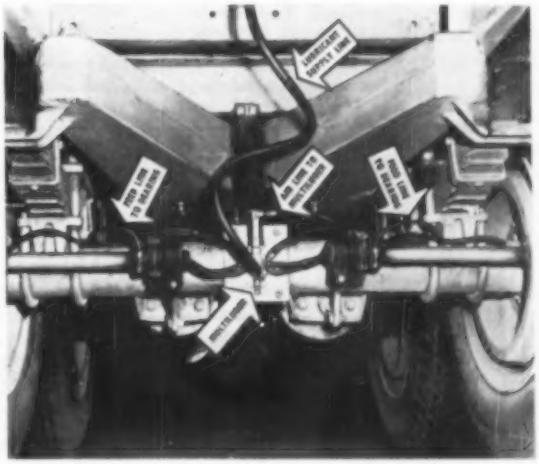
. . . save on truck lubrication

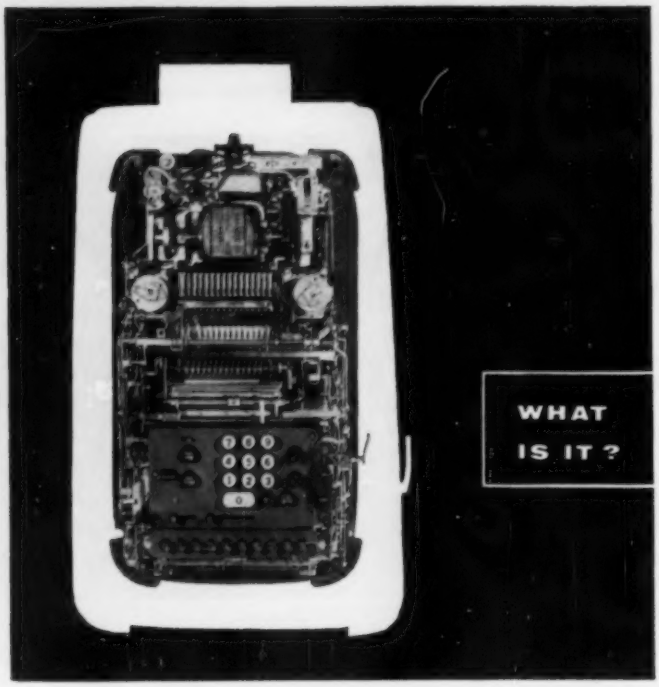
Multi-Lubers on 29 Standard Oil Co. (Ind.) trucks and trailers may save the company as much as $1500 per year. The Multi-Luber, made by Lincoln Eng'rg Co., lubricates automatically and eliminates manual application.

For truck use, the system consists of a dispensing mechanism, a 4-gallon lubricant reservoir, a supply line from the reservoir to the dispenser, an air line from the brake system to the dispenser, and 12 flexible nylon oil lines (less, if desired) to feed lubricant to special fittings.

On over-the-road vehicles, Multi-Luber is actuated at each brake application. On city trucks, a timer actuates it every sixth braking. A metered amount of lubricant is fed into each line.

Digested from NATIONAL PETROLEUM NEWS, Aug, p36





It's got 10 keys, an infallible memory, and is held in high esteem by bankers, accountants and insurance men!

It's the "99" — and this isn't another riddle! "99" is the easy-to-remember name of Remington Rand's new easy-to-operate printing calculator. And "99" gives you some idea, too, of the number of uses to which you can put this fully-automatic mechanical prodigy! It multiplies, divides, adds and subtracts with lightning speed — and still finds time to give you printed proof of its accuracy every step of the way! No wonder insurance men, accountants and bankers — men who know the importance of efficiency *best* — prefer the "99" *most!*

See your telephone directory for Sales and Service Offices in Algeria, Argentina, Belgium, Brazil, Burma, Canada, Ceylon, Chile, Colombia, Cuba, Federation of Malaya, France, Germany, Holland, India, Italy, Japan, Mexico, New Zealand, Norway, Pakistan, Peru, Singapore, Sweden, Switzerland, United Kingdom, Uruguay and Venezuela. In all other countries contact your local representative.

Here are just a few of the jobs a "99" can do — BETTER!

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- Computing amortization
- Account analysis
- Proving postings
- Computing discounts
- Cost accounting
- Prorating
- Premium quotations
- Policy loan calculations
- Reconciling statements

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For New Ideas . . .

. . . watch the aviation industry. Its problem solutions may benefit your industry or business

Digested From AVIATION WEEK, June 20, p30

Aviation's rapid progress has turned up new materials, original processes, improved designs. Any of these, with little adaptation, can be fitted to other industries. Some of the developments worth watching are:

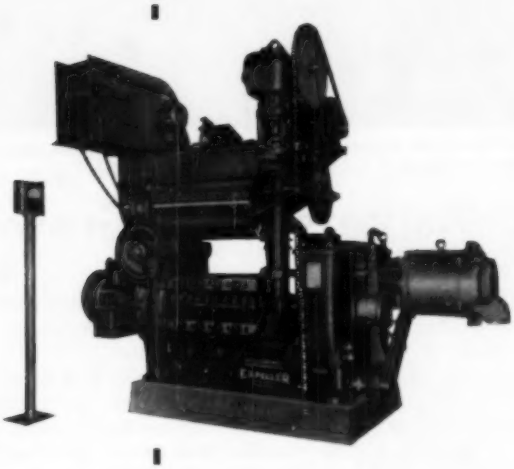
High-speed aircraft need materials with a high strength-to-weight ratio. From this need have come structural plastics, adhesives, and rigid but lightweight sandwich-type constructions. Outside the aircraft industry, structural plastics find their way into storage tanks, ducts, piping, boats, and sports cars.

Adhesives pioneered by the aircraft industry have been eagerly accepted by other industries. They now join metal to metal parts in reels for motion pictures and tape recorders, plastic to metal parts in slip rings, glass to metal parts in hypodermic syringes, and rubber to metal parts in gasketing. Sandwich-type constructions have opened many new possibilities in prefabricated housing, doors, table tops, partitions, and flooring in trucks and trailers.

Foamed-in-place plastics were originally designed for the aircraft industry. But so far, industrial use has been limited to only a few special or experimental items such as boats, refrigerators, and shipping containers. Research by both aircraft and other industries is certain to overcome their present limitations.

The aircraft industry has practically revolutionized the electronics industry. It's the force behind the drive for miniaturization of components and equipment. Television and radio manufacturers are just beginning to employ the techniques sponsored partly by the aviation industry. And in the field of controls, many of the concepts and designs of industrial controls first appeared in aircraft. As aircraft get more complex, new control designs will be developed.

ANDERSON CRACKLING EXPELLERS . . .



the most efficient method of producing cracklings and grease or tallow!

The use of Anderson Expellers has spread throughout the meat packing and rendering industries (over 600 are now in service) until today it is recognized as the most efficient method of producing cracklings and grease or tallow.

Expellers show a tremendous saving in labor over other methods. When raw material and finished products are handled by conveyor, one man can oversee the operation of even a battery of Expellers. Use of Expellers also assures the production of quality products. Cracklings are of extremely high quality, having high feeding value, low grinding cost and good color. Expellers increase the yield of grease and tallow and do not darken their color.

Expellers are made in three models. All models are extremely rugged resulting in low maintenance and operating costs. The models from the smallest to the largest in capacity are Red Lion, Duo, and Super Duo. They can be equipped with various feeding and conveying equipment for above floor feeding or floor feeding. Anderson run-around elevators are available for multiple installations.

Write for your copy of Anderson's New Crackling Catalog

Here is the latest, complete up-to-date information on Anderson Cracking Expellers. This catalog contains detailed specifications, descriptions, and advantages of the various types of Expellers. It also fully describes the process including the relationship of Expellers to cooking equipment, and various types of conveying equipment for floor feeding, above floor feeding, and multiple groups of Expellers. Anderson feather dryers, magnetic separators, feeders, and conveying equipment are also described. Write for your copy today.

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London	55.00	40.50	14.50
Madrid	61.00	45.00	16.00
Paris	58.50	43.00	15.50
Rome	69.50	51.00	18.50
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DRAMATIC SIGNS are the biggest users of acrylics. The possible effects have pushed this postwar-developed application to the top of the list.

Acrylic Markets Keep Growing

Digested from CHEMICAL WEEK, Aug. 6, p81

A big and lively market waits for the companies that get into acrylate production. In the U.S., for example, one company has long dominated the market. But the promising outlook in this business is bringing in new producers. Here is what's happening:

- Rohm & Haas is vigorously developing new outlets for acrylates and methacrylates.
- Union Carbide & Carbon plans to increase its production facilities.
- General Aniline & Film is getting ready to compete for a special corner of the market.

All this activity is alerting chemical manufacturers and acrylic users. But some markets thought secure are losing ground. New markets are expanding rapidly. Technical difficulties are plaguing some producers. The whole acrylic situation is thoroughly unsettled.

Hottest item under debate right now is the need for a new glazing (window) material for jet airplanes. Faster planes will place demands on plastics that cannot be met by the old favorite, polymethyl methacrylate (Plexiglas).

General Aniline feels confident that the answer is its Gafite, a chlorinated methyl acrylate polymer. Rohm & Haas and American Polymer are both working on the problem.

The largest single outlet for acrylics is now in outdoor signs. This use, plus skylights and lighting fixtures, keeps the plastic sheet business on top.

Second place is held by molding powders. Lenses in automobile lights (but not headlights), nameplates, and a host of other items prop the demand for methacrylate molding powders.

A recent estimate placed U.S. acrylic plastic demand in 1960 at 80-million pounds—up a third from present demand. In these 5 years powders are expected to rise 50%, sheet 10 to 20%.

But acrylic emulsions will compete strongly for second place. The emphasis is on acrylic paints. One paint manufacturer estimates current consumption of acrylates for this purpose at 2-million pounds per year. Monomer costs are expected to decrease, which could pare somewhat the comparatively high prices of acrylic paints. Other uses for acrylic emulsions are in leather finishing, textile finishing, and paper treatment.

Acrylic oil additives are fourth in importance. They improve viscosity, depress pour points. Rohm & Haas, so far, is the only major maker of acrylic additives.

The future of acrylics is anybody's guess. Much depends on how many manufacturers get into production, how much research they and possible users do to broaden application of the acrylics.

Better Chrome Plate

Called Crack-Free Chromium, it's the result of a brand-new process with a special bath

Digested from CHEMICAL ENGINEERING, Aug, p230

Ordinary chromium deposits more than 0.0001 inch thick have cracks that allow corrosive agents to reach the underlying metal. At decorative thicknesses, such plating contains pores, which also admit corrosive agents. Then as the deposit thickness increases, the number of pores decreases, but a cracked structure appears.

To cope with this situation, chromium plating practice has required a deposit of nickel under the chromium. This extra plating operation is no longer necessary.

Crack-Free Chromium has been developed by United Chromium, Inc. (New York, N. Y.) to solve this problem. The process allows direct chromium plating on steel with these advantages:

- Excellent corrosion resistance.
- Still crack-free when heated to 1000°F. and plunged into water.
- Softer and more ductile than ordinary chromium plating.
- Excellent adhesion.
- Improved non-galling, non-seizing, and leveling properties.
- The same protection as the commonly used composite copper-nickel-chromium decorative finishes.

Photomicrographs of crack-free plate cross-sections show a dense, continuous structure. Photomicrographs of ordinary chromium plating, however, show cracks that extend through the deposit.

Crack-free plating is done with a special chromic acid bath that has automatic regulation of the amount of catalyst. It is prepared by simply dissolving a single compound in water and maintained by adding the same compound.

The bath, according to field reports, is easy to operate and maintain. Its throwing power is good and its plating speed about the same as that of the ordinary chromuim plating bath. Standard plating equipment and procedures are used with the new bath.

How Industry the World Over Combats Rising Costs

In DENMARK, for example

Clean, orderly warehousing of paints and lacquers by means of Clark trucks has accomplished big savings for S. Dyrup & Co. in Copenhagen. The operating rhythm is steady and uninterrupted; and accidents are practically unknown. Cleanliness. is easy to maintain. Formerly, the storage of canned products was slow, difficult and costly.

In SOUTH AFRICA

Fast, low-cost handling is a necessity for South Africa's industry, to keep pace with its increasing volume and diversification. Moving this heavy concrete form, ordinarily difficult and exceedingly hazardous, is easy for a Clark 1000-lb. fork truck.

And in URUGUAY

Sharply on the alert for more efficient, more economical methods, Uruguayan industries have found that the more uses they can find for Clark fork trucks, the greater are their savings of time and money. Here you see a Clark truck handling cartons of labels in a printing plant.

Learn how the world-famous Clark method of materials handling can provide substantial savings for your business. Consult your local Clark distributor —write for his name.

EXPORT DIVISION
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Typical of their service in the construction industry was the use of Symons Cone Crushers in producing concrete aggregate for the 100 million dollar Hungry Horse project at Kalispell, Montana, one of the largest and highest dams in the U. S. A.

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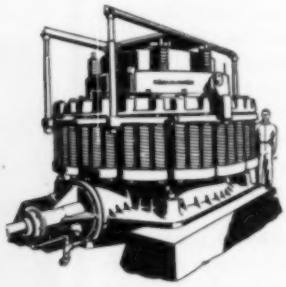
CONSTRUCTION INDUSTRY
throughout the World...

SYMONS® CONE CRUSHERS

meet the need for large tonnages of fine Aggregate and Sand

• In dam, highway, bridge and countless other construction enterprises employing modern engineering methods and equipment, the need for vast tonnages of quality aggregate and sand is constantly increasing. Symons Cone Crushers meet such demands, providing specification concrete aggregate and sand of proper gradation and quality. Both in aggregate and sand production, Symons Cone Crushers have long been the choice of leading producers throughout the world.

For any construction project, wherever you need great quantities of finely crushed product at low cost, it will pay you to specify Symons Cone Crushers . . . as well as Screens, Grinding Mills and other Nordberg Machinery for the construction industry . . . *all* designed and built to deliver maximum output at lowest possible cost.



• SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter — in capacities from 6 to 900 tons per hour.

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For performance with economy choose the sparkling new Thames ¼ ton Van. Save time and money on every job. The sleek modern styling will bring extra prestige to your business too. No wonder this impressive van is the unchallenged leader in the delivery field.

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about the full range of the famous Thames Commercial Vehicles. The sparkling new ¼ ton Van; the ½ ton Van, tested and proved over millions of miles. The 1½ ton and 2 and 3 ton models fitted with the outstanding DAGENHAM-BUILT DIESEL ENGINE or the 'Cost-Cutter' Petrol Engine . . . and the 4 and 5 ton models with choice of the powerful, economical 85 b.h.p. V.8 engine, or the famous P.6 Diesel.

the new

THAMES

¼ TON VAN

A PRODUCT OF
FORD MOTOR COMPANY LIMITED · ENGLAND

Digested from BUSINESS WEEK, Aug. 20, p54

A Bright New Way . . .

. . . of cutting highway death toll at night is clothing woven with a reflecting yarn called Flecton. You would never know it, but the young lady is carrying an umbrella of no darker shade than her coat. Flecton makes the difference. When light from automobile headlights strikes the coat, it reflects bright silver, can be seen 860 feet away, even with low-beam lights. Minnesota Mining & Mfg. Co. (St. Paul 6, Minn.) makes the yarn.

Catalytic Reforming . . . Progress Report

Digested from PETROLEUM PROCESSING, Aug, p1157

It's even bigger than the experts thought it was.

Last year they talked in terms of 500,000 barrels per day of catalytic-reformer capacity in the U.S. and Canada by the end of this year. But today, capacity in operation is over 900,000 barrels. And 380,000 barrels more of capacity is being built or is definitely planned.

The rapid acceptance of catalytic reforming as a basic processing tool is remarkable. It was only 6 years ago that the first modern catalytic reforming process was announced. Today, ten processes are competing as a source for motor fuels, aromatics, and by-product hydrogen.

• **Motor Fuels**—By the end of the year, reforming will account for 11.3% of crude-oil runs in the U.S. and catalytic cracking for 39.5%. Cracking will taper off as reforming continues to increase its capacity. In 10 years, reforming may account for 25% of crude runs and cracking about 42%.

But reforming capacity will level off as octane requirements rise. More efficient processes will likely be developed to produce 100+ octane gasoline more efficiently than reformers now can. By 1965, some commercial fuels may reach the 102 research octane that may be needed by at least some automobiles by that time.

Expected improvements: desulfurization and other feed preparation steps, more severe reforming, combining aromatics and reformate production, and further treatment of reformate.

• **Aromatics**—Petroleum is taking from coal the market for three major aromatics—benzene, toluene, and xylene. In 10 years, petroleum's share is expected to increase from the present 51.5% to 61%.

Demand for these aromatics will strengthen. They have high octane blending values with gasoline.

• **Hydrogen**—Refiners are getting large volumes of by-product hydrogen from reforming. In the refinery, it's being used for desulfurizing feedstocks, upgrading a wide range of finished products, and manufacturing of aviation gasoline.

Other industries too are making good use of this hydrogen. It hydrogenates fatty oils to eliminate objectionable acids and to convert liquid oils to solids. It acts as a reducing agent in the manufacture of metal powders and metal hydrides.

As catalytic reforming grows, what should the industrialist watch for? Any change or improvement that might provide valuable chemicals for his use or in competition with his products, any processing techniques that he might adapt to his own processing needs, and finally any equipment developments that might provide a ready market for his services.

—ANY METAL

—ANY SHAPE

No hack saw blade will cut faster or last longer than the right Victor Blade. Throughout the world, Victor offers the complete line of Victor Blades—hand and power—in a wide range of types, sizes and pitches. The right blade for every metal-sawing job. Victor blades are more economical because they cut faster, last longer.

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BLADES
For Metal-Cutting Economy

1491

VICTOR SAW WORKS, INC.
Middletown, New York, U.S.A.

Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades.

The Reader *His Mark*

THE ABC SYMBOL, which appears at the head of this page, is your brand—the reader's brand—on this magazine. It stands for Audit Bureau of Circulations. It means that this magazine will stay in business only so long as it continues to serve its readers to their satisfaction.

That Bureau—known for short as ABC—is a voluntary, non-profit, cooperative association founded in 1914 by a group of publishers, advertisers and advertising agencies who wanted to establish and maintain higher standards of publishing practices than then prevailed. Its primary and specific purpose was to set up yardsticks to appraise circulation values and to verify the claims of publishers as to their circulations. For the buyer or advertising space this provides an effective means to take some of the guesswork out of buying and to reconcile the conflicting claims of competing publishers. BUSINESS WEEK magazine has aptly described ABC as "the publisher's conscience—and cop."

BUT IN DOING that job, ABC performs another function of high importance to the readers of ABC member publications. It provides a constant pressure on the publishers to keep alive in their staffs a sense of primary responsibility to their readers. That is because the most simple and direct method of making a publication responsible to its readers is to place upon it a purchase price, whether by subcription or newsstand purchase. The right to purchase or to refrain from purchasing a publication gives to the reader and to no one else the power to pass effective judgment on the publisher's success in serving the reading public. Each paid publication will grow or languish, will prosper or fail, in proportion as it wins or loses the following of thousands or millions of readers. The readers, by their patronage, record their judgments as to whether the publisher and his publication are measuring up to their responsibility to them.

And that is where the ABC comes into the reader's picture. The newspaper or magazine that carries the ABC symbol on its masthead must in the first place be a paid circulation publication. Moreover, it must conform to the high standards set up by the Bureau as to terms of payment and accounting methods. And again it must open all of its books to the auditors of the Bureau on demand.

SINCE THE INFORMATION thus determined by thorough and impartial audit is periodically made public through the ABC statements and audit reports, it is constantly available to and universally used by advertisers who are considering the purchase of space in an ABC publication. These reports show the circulation trend, as verified and certified by ABC, and thus put the advertisers in a position to know whether or not the publisher is rendering satisfactory service to his readers.

Thus the publisher who submits his publication to the supervision and discipline of ABC affirms in the strongest possible manner that he recognizes his primary obligation is to his readers and that he owes his standing to a voluntary demand by those readers. It follows that the editors of ABC publications must be exceptionally alert to the desires of their readers and responsive to their needs, since any decline in circulation will soon show up in the ABC statements and audit reports.

THAT IS WHY we describe the ABC symbol as the reader's brand. It shows that a publication must be primarily responsive to him and that he holds in his own hands its success or failure. And that ABC symbol is not only a constant reminder to him of that fact, but also an equally constant reminder to all concerned that the reader's willingness to pay for the ABC publication is the acid test of its value to him and to the advertiser.

McGraw-Hill International Corporation

two dates for 1956

An extra and earlier fair!

A big change this year—we are holding *two* fairs!
Different classes of goods will be shown at each.

The February Fair is devoted to certain classes of consumer goods.
We have planned this extra Fair to help buyers who prefer to do their buying early in the year. It will be held at Earls Court, London.

At the April Fair you will see other consumer goods and goods in other classes at Olympia, London, while the Hardware and Engineering exhibits will be at Castle Bromwich, Birmingham.

At both Earls Court and Olympia there will be "Fairs within Fairs", where individual trades will hold their own trade shows within the B.I.F.

All in all, a bigger, more comprehensive B.I.F. than ever before—more worth visiting than ever before!

The February Fair

FEB 22 — MARCH 2

EARLS COURT, LONDON

The British Toy Fair
Baby carriages
Brushware
Chemist's supplies
Fancy and leather goods
Jewellery, cutlery, silverware, watches and clocks
Paper, stationery and printing
Pottery and glassware
Sports goods
Toys and games
General services

The April Fair

APRIL 23 — MAY 4

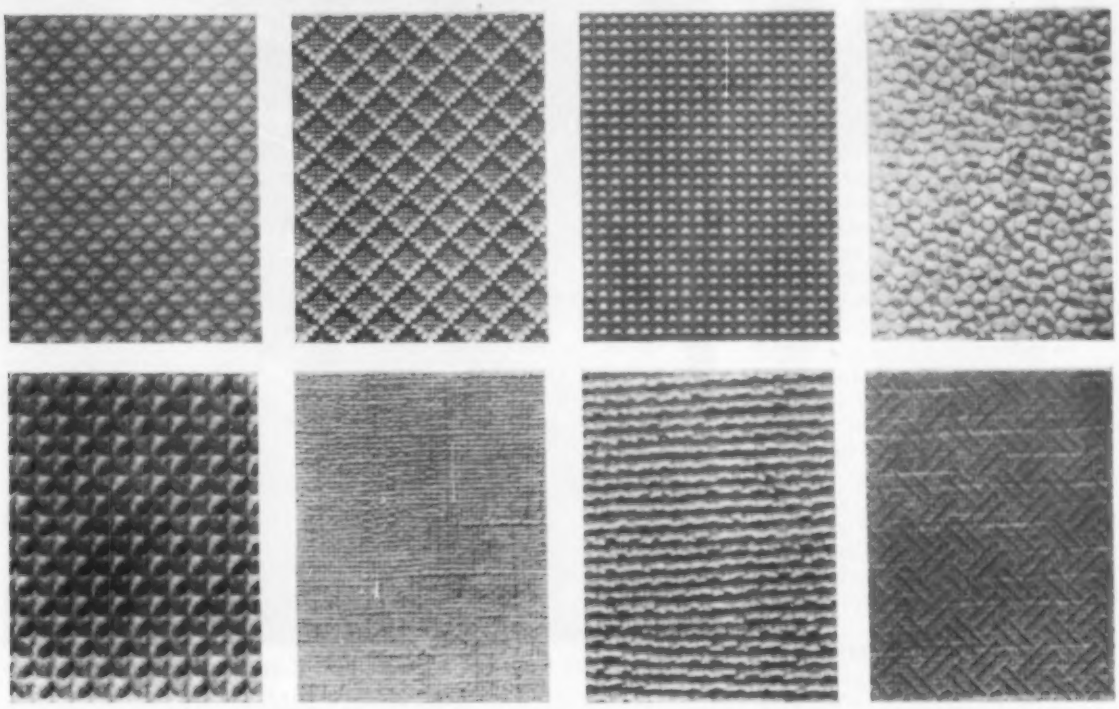
OLYMPIA, LONDON

Chemicals
Industrial & domestic electrical plant & equipment
Office machinery and equipment
Packaging and printing machinery
Plastics
Scientific, optical and medical instruments

CASTLE BROMWICH, BIRMINGHAM

Hardware
Building and heating
Engineering

Information is obtainable from the nearest British Embassy, Legation, Consulate or United Kingdom Trade Commissioner.



THESE UNUSUAL MATERIALS are made up of embossed fabric and plastic-sheet backing with color supplied by deposited metal and by printing on the inside or outside of transparent or tinted plastic film. The process puts . . .

Metal Coats on Plastics

Digested from PRODUCT ENGINEERING, Aug, p182

Metallized plastic films are new materials that combine the flexibility and low cost of plastics with the useful properties of certain metals.

Two basic methods are used to deposit metal on plastic sheet: cathode sputtering and thermal evaporation. Both are done in a high vacuum.

In cathode sputtering, the metal is vaporized in an arc; surface atoms are dislodged and deposited as a film on a suitably positioned surface in the vacuum chamber. One disadvantage is that cathode sputtering cannot deposit aluminum.

Thermal evaporation is a simpler, lower-cost process and therefore is more widely used. In commercial continuous systems, metal feeds into a shallow crucible and there is heated to a temperature high enough to cause evaporation. The metal condenses on the relatively cool surface of the plastic sheet fed over the bath. Coating thickness for both methods ranges from 5-millionths to 16-millionths of an inch.

Most metals can be deposited by evaporation or sputtering. But only aluminum, gold, silver, copper, and zinc are used for production metallizing in continuous processes. Aluminum, gold, and copper are the most popular because they provide fine decorative effects.

The thin deposited layer of metal offers more than decorative effects. It conducts electricity and heat. It reflects light; the reflected color depends on the metal and, for gold, on the thickness of the deposit. Copper is red-pink, aluminum dazzling white.

The metal layer reflects heat, too. An aluminum film reflects about 90%, compared with 10% for unpolished steel. Corrosion resistance also is good, except for silver coatings, which tarnish.

Base materials that can be metallized include Mylar polyester film, cellophane, cellulose acetate, polystyrene, polyethylene, and vinylite. As the metal vapor coats uniformly, smooth base surfaces are bright after metallizing while embossed or grained surfaces are comparatively dull.

The cost of metallizing sheet material depends on thickness of the base material. The design engineer should specify thin materials. When rigidity is important, laminating of thin films to thicker sheets may cost less than metallizing thick sheets. Lamination also protects the metal when the metal side is laminated to the backing material. Mylar

film, for example, can be laminated to vinyls, cloths, acetates, chip board, wood, and unmetallized Mylar.

The engineer selecting the backing materials should consider design requirements for resiliency, subsequent embossing, weathering, heat resistance, and cost. He also has available a wide variety of embossing patterns. Broad geometric types are best suited for rigid backing materials where large surface areas are to be viewed. Soft cotton cloth or paper backings seem to work best for small irregular patterns.

As design engineers are becoming better acquainted with metallized plastic films, their use is increasing steadily. Until recently, metallized films were limited to expensive applications such as decorative wrappings and condenser tissue. But the availability of continuous metallized materials in commercial quantities has changed all this. Current applications include:

In the optical industry: unbreakable welding goggles, sun glasses, movie projection screens, unbreakable mirrors, vacuum-formed electric switch plates, and reflective sheeting for lane markers, automobile bumpers, highway signs, and lifebuoys.

In the electrical industry: self-heating condensers of aluminum or zinc on a high dielectric film, radiant heating panels, window defrosters, and printed circuits.

New

A button-sized battery has 25% more capacity than any other comparable sealed battery and a working life of about 2 years. It is a part in Elgin National Watch Co.'s electrical watch.

Secret of the battery's success is an indium anode. This soft, silvery metal has little tendency toward leakage and gassing. Thus separators and cases may be much thinner. A cell, a semicircle with about a $\frac{3}{4}$-inch radius and $\frac{3}{16}$-inch thick, will deliver 1.15 volts. Similar cells might be used in many kinds of small instruments, including portable meters.

Digested from AMERICAN MACHINIST, Aug 15, p135

VACUUM, solid bowl, and perforate bowl clarify "hard-to-filter" solutions

New Filter Technique

Digested from CHEMICAL ENGINEERING, July, p132

Searching for a way to clarify gelatin by centrifugal force, Eastman Kodak Co. demonstrated how engineering ingenuity can solve "the impossible job."

The job in this case: to remove solid particles with a wide range of size and density from gelatin solutions in film manufacture. Commercially available equipment could do the job stepwise, but production was slow because the solution foamed excessively at discharge. Once the foam formed, a number of vacuum cycles were needed to remove the air; during this time, bacteria attacked the gelatin, causing it to deteriorate.

Eastman Kodak's solution: a double-bowl centrifuge that can process a 30-gallon batch of gelatin solution under a 29-inch vacuum. The bowl assembly, 12 inches in diameter, rotates at 3,500 revolutions per minute.

Its inner perforate section is lined with filter paper to remove coarse, floating particles. Its solid section has horizontal ring baffles with a smaller inside diameter than the overflow lip; it removes remaining, finer particles. Liquid can move toward the discharge lip only by flowing through several small holes located in the outer diameter of the ring baffles.

Special liquid discharge under vacuum overcomes aeration and foaming troubles. Solution temperature can be closely controlled.

Where did the engineering ingenuity come in? Mainly, in bowl design and in the prevention of foaming by use of a vacuum. As vacuum operation can be quite tricky, Eastman Kokak engineers enclosed the centrifuge entirely within a jacketed vacuum chamber. A rigid spindle, driven by an external motor, supports the basket.

Eastman Kodak is not recommending the unit for any other specific filtering problems. But the principle, with modifications if necessary, can certainly be applied under similar operating conditions.

YOU AND YOUR PERSONAL AFFAIRS

Can you get on your feet and talk? The executive accustomed to public speaking can, but most of us get stage fright when the spotlight of attention centers on us. There's one proved way to get rid of that fear—speak, and speak as often as you can. In the meantime, these simple rules may help:

Talk only about points you feel are important and interesting to your audience. Know your material thoroughly. Use notes to guide you. Before the fatal day comes, practice your speech on your wife—and ask for her opinion.

Take a few slow, deep breaths just before you rise to speak or when you feel yourself growing tense. Don't be afraid to smile or act friendly. If the audience smiles or laughs, say at a fly buzzing around your head, laugh along.

Think about the audience as friends. Try singling out someone in the back of the room and talk to him.

Don't defeat yourself or be apologetic. You are up there talking because you know what you are talking about. And remember—stage fright is not a fatal disease.

✦ ✦ ✦

For the outdoor type of man, there's a new jacket insulated with expanded vinyl foam. The lining protects the wearer against cold and wind, and is buoyant enough to support him in water. The maker is U.S. Rubber Co. (New York, N. Y.).

If you are wearing the jacket while fishing, you may like to try something else new—a fishing lure. A small amount of mercury inside the plastic body causes it to wiggle and dive. Called Mercury Worm, it's made by K-L Co. (Angola, Ind.).

✦ ✦ ✦

Eye specialists say that too many older patients, those over 40, put off seeing their doctor. As you grow older, you will have trouble in seeing objects clearly from various distances. The focusing point of images on the eye recedes, causing you to hold reading material farther and farther away.

The doctor can help by giving you proper glasses, possibly special reading glasses or bifocals or even trifocals to cover the whole range of distances. At the same time, he can detect cataracts that are beginning to form, high blood pressure, kidney disease, diabetes—all by looking into the eye.

To help your eyes even more, also get yourself a good reading lamp for home. It should give you from 50 to 75 footcandles of diffused, glareless light; that is many times more light than normally available in a home.

YOU has been compiled from American Business, Business Week, Factory Management & Maintenance, and other sources.

108
Standard Models

Honan-Crane
Multi-Cartridge Filter

Why 108 models of the same basic filter? *Because each oil filter application creates individual problems.* Scores of variable factors are involved: type of oil, additives, oil viscosity and temperature, flow rate, capacity, space available, nature and degree of contamination, type of heating required, and many more. *All* of these factors must be considered in selecting the proper filtration unit.

Honan-Crane Multi-Cartridge Filters are available in 108 models, ten sizes, and with six different types of interchangeable cartridges, each designed to do a special filtering job. Thus, no matter how unusual or difficult the application, you get a filter exactly suited to your requirements . . . and readily adaptable to *changing* requirements.

The same wide choice of models is also offered in Honan-Crane Bulk Refill and Full Flow type Oil Filters. Custom filtration performance is *standard* with Honan-Crane.

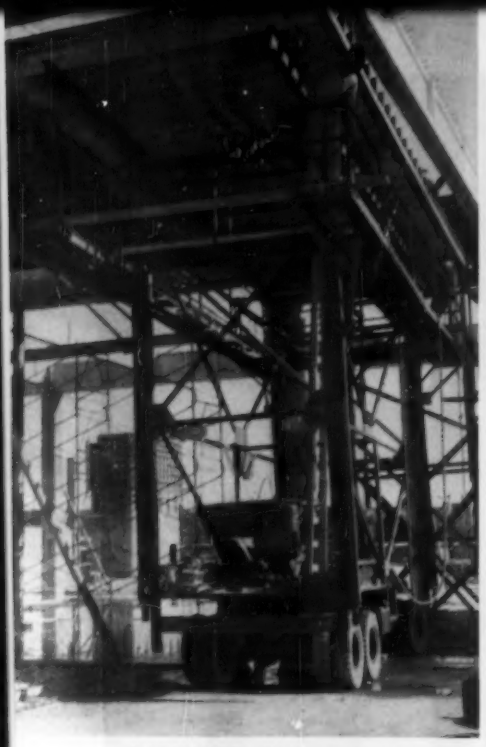
Write for three 8-page Equipment Bulletins:
No. 101—Full Flow Filters
No. 201—Multi-Cartridge Filters
No. 201—Bulk Refill Filters

26 Madison Avenue
Lebanon, Indiana

of Indiana

HOUDAILLE-HERSHEY OF INDIANA, INC.
FILTRATION DIVISION

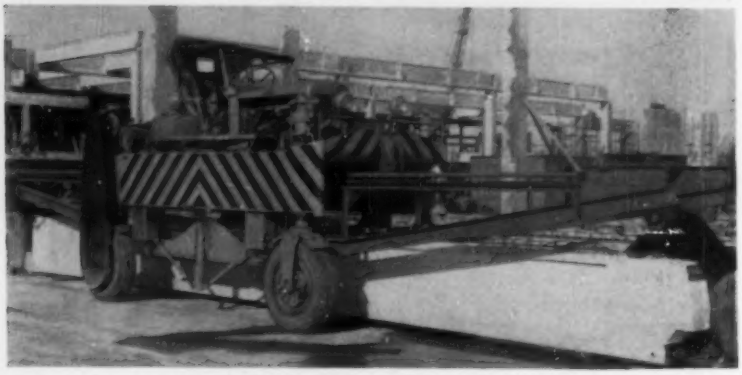
A SUBSIDIARY OF HOUDAILLE-HERSHEY CORP.



PORTABLE TOWER speeds placement of roof forms.

PRESTRESSED beams and columns were precast for erection economy.

JACKS tensioned the bars; then nuts were tightened to anchor them.



STRADDLE TRUCK with hydraulic lift and special attachment shifted beams from casting yard to building site. There a mobile crane took over handling.

Precasting Cuts Costs

Digested from ENGINEERING NEWS-RECORD, July 21, p33

Precasting and prestressing saved $45,000, compared with a cast-in-place, reinforced-concrete alternative on a $2,234,000 materials-handling warehouse built for Boeing Airplane Co. at Seattle. In addition, the 290,000-square foot structure was finished in 189 days, instead of the 245 days required for cast-in-place construction.

Not only were beams and girders precast, but also the columns and walls. Only the roof was cast-in-place, and it was designed to act as part of the top flange of the beams. The building required precasting of 146 girders, 460 beams, 190 columns, and more than 500 wall panels.

Six sets of steel forms were used for the beams, two for the girders. Each set handled at least 73 pours. A 30-ton batch plant provided concrete for the precast members. A mix containing 7 bags of cement per cubic yard met design requirements.

Beams incorporated three, and girders five 1¼-inch-diameter high-strength steel bars for applying the prestress. Flexible metal sheaths surrounded the bars to prevent bond with concrete before tensioning. For grouting the bars in later, a grout tube was taped in place in openings near each end of the sheaths. Some reinforcing bars were also used.

Concrete was transported in a bucket by crane from the batch plant to the forms. There, it was dumped into the bucket of a four-wheeled buggy for distribution. This buggy rode a platform above the forms and released the mix through a gate above and parallel to a slot in the platform. Over a period of about 10 weeks, 12 beams and four girders were precast each day on a two-shift basis.

A tarpaulin was placed over the members 1 hour after they were cast and steam introduced under the cover for curing. As many as 16 units were cured at a time. Curing was stopped to permit the forms to be stripped generally 4 hours after concreting—and then continued for a total of about 30 hours. Time varied slightly to suit the work conditions.

Tendons were tensioned on the third day. Two calibrated hydraulic jacks applied the pull at opposite ends of the members. In an average time of less than 30 seconds per bar, the tendons were stressed to 100,000 pounds. The bars then were anchored by tightening nuts on the ends against steel plates on the beams and girders.

Excess exposed steel was burned off. Next, grout was applied at one end of the sheaths enclosing the tendons until forced out the other end. Finally, both ends were plugged under pressure. This procedure was adopted to assure

complete filling of the sheaths, fully embedding the tendons.

Equipped with anchor inserts for the purpose, beams and girders were removed from the casting yard by a straddle truck. They were moved either to a stockpile or into the building for erection.

Columns were precast in a horizontal position in plywood forms that were reused about ten times. Concrete was placed from a powered buggy.

For seating the columns on the foundations, a round cup, 2 inches deep, was embedded in the lower end of each vertical member. The cup fitted over a 2-inch-diameter steel pin extending 3½ inches above the foundation pier.

To receive the columns, each pier was built with a pocket that was grouted just before the column was erected. The seating detail permitted easy, quick erection of columns and gave some rigidity to the column base.

The wall panels were cast one atop the other, five high, requiring only edge forms. They were attached to the building frame by welding steel plates to steel on columns.

Construction of the cast-in-place roof was simplified by a portable tower for placing the forms. Contractor-designed, this truck-mounted jumbo was capable of handling the form for the whole of a 14x40-foot bay. It positioned and held the form until it could be supported on the bottom flanges of the beams.

The upper portion of the steel platform could be moved backward or forward, and sideways by controls on the platform. The forms also could be shifted vertically. This vertical adjustment allowed the rig to clear all overhead obstructions. Exact placement could be obtained of every part of the form. Once placed on the jumbo, the forms did not touch the floor again until after they had been used for the last time.

The jumbo held as many as seven men, who often remained aloft during an entire shift. It eliminated the need for other scaffolding. The only shoring needed during the entire operation was a single 10-inch-diameter timber at mid-span of the girders to improve continuity conditions.

Can't Do Anything About the Weather?

New Heat-Cool Systems Promise Relief

Digested from ARCHITECTURAL RECORD, July, p194

Out of intensive research have come three heating-cooling systems that can make your home or office immune to nature's worst offenses.

1. Perimeter System—Biggest change from conventional finned-coil perimeter-heating systems has been to move the coils from the floor to the ceiling and make them do double duty—both heat and cool. Engineers of the John B. Pierce Foundation, developers of the system, feel that utilization of the ceiling as a radiating surface is a natural progression.

They give two reasons for the ceiling installation:

- Radiant-heat transfer travels downward just as effectively as it will upward.
- The system can operate as a cooling system during warm weather simply by circulating cold water instead of hot water.

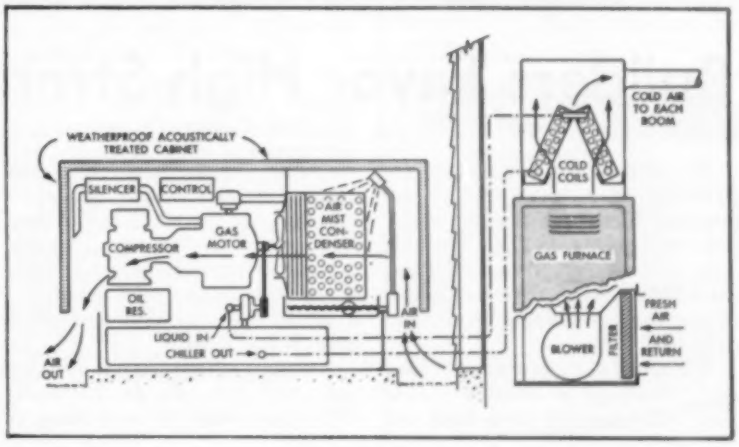
A ceiling system has its advantages. The ceiling is virtually unobstructed. Wall areas are left free. No floor space is lost and doorways present no problem. On the debit side, more piping is necessary. But lower installation costs may offset this.

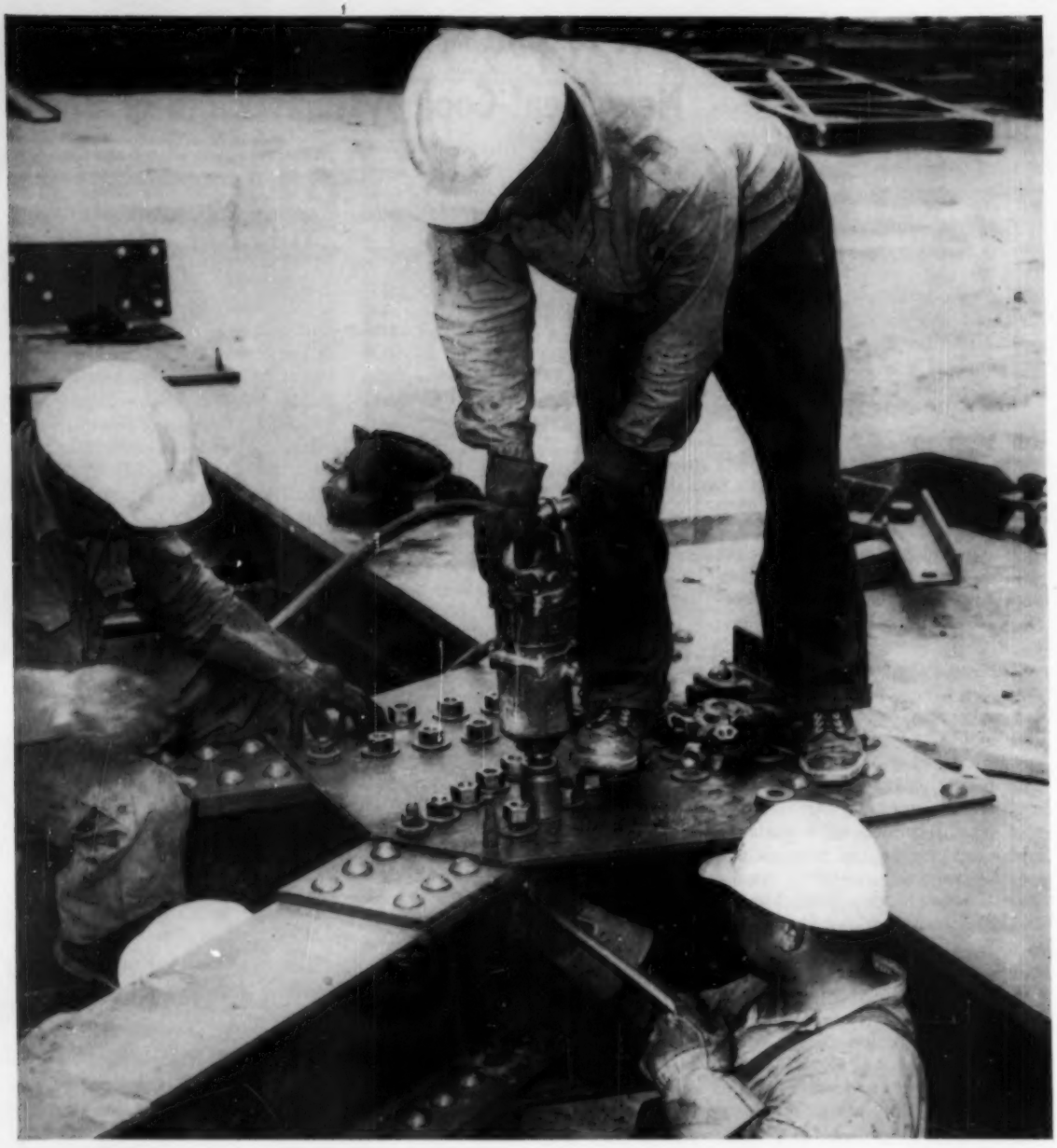
2. Atom-powered System—In the near future, atomic energy may power home heating and cooling systems. That's the prediction of Robert E. Ferry, general manager, Institute of Boiler and Radiator Manufacturers.

The system can be added to existing home heating boilers or installed as an integrated package. It can provide hot water in winter and cold water in summer. Heart of the system is a portable reactor, about twice the size of an automobile battery. Fuel will probably be some form of radioactive ash completely shielded and perfectly harmless. Expected life of the reactor: 6 years. Cost over the 6-year period would be one-fifth that of a conventional unit's operating cost.

3. Gas-powered Air Conditioner—The trend toward gas for home heating has spurred design of a gas-powered summer air conditioner that can operate with a conventional gas-fired furnace (see drawing below). Coleman Co. puts a complete factory-assembled refrigeration system, enclosed in a weather-proof acoustic cabinet, outside the house. Everything necessary to convert the heat energy of gas into a chilled liquid is contained in the box. Chilled liquid lines will run from the outside refrigeration unit to the cooling coils on top of the furnace. Conventional in-wall ducts and standard registers supply either cooled air or heated air as required by the weather.

Gas-powered air conditioner integrates with gas-fired furnace





Builders Favor High-Strength Bolts

Digested from ARCHITECTURAL RECORD, July, p189 and BUSINESS WEEK, Aug 13, p140

The workmen in the picture are symbolic of a trend that is appearing these days in the steel-construction field. They are putting a building's frame together with bolts. Two or three years ago, a riveting crew would have done this job.

The trend got underway because of a shortage of riveting crews. But other factors have been responsible for the headway it has made. One is speed. A bolt crew can do a big job much faster than a crew of riveters can, usually making it possible to put a steel skeleton together in 6 months—a month less time than a riveting crew would need.

Another advantage of bolts is that two men can do the work. (The third man in the picture is setting up the bolts for the bolting crew.) Riveting demands four. Furthermore, a bolt crew can be put together and trained to operate efficiently in a week or so, whereas a riveting gang must work together for a year or more to develop real teamwork.

Bolting enthusiasts insist that inertia is the only thing that keeps the bolt from dominating the field,

and they complain that outdated building codes still demand riveted frames. But codes can be changed.

Purely on the bases of initial costs, bolting seems to be more expensive than riveting. You can buy a rivet for about 7¢; a bolt and nut of the same size cost 35¢. But the price spread closes quickly once bolts and rivets begin to compete in erection. Because bolting is so much faster, the high initial cost for bolts ceases to mean much.

In a survey aimed at finding out why bolts are being used, *Architectural Record* comes up with these comments from architects and engineers working on various structures:

• **Labor**—"Unavailability of welders and riveting crews was prime factor." "Fitting-up crews can continue as bolters, thus saving both time and money."

• **Time**—"Erection time was materially shortened, using only 37 working days for a 15-story building on a difficult working site." "The necessary equipment for riveting such as forge, scaffolding, heating of rivets are eliminated. Therefore, I would consider riveting a little more time-consuming than bolts."

• **Noise**—"A good bolt job will be somewhat noisy, but it is a noise considerably easier than riveting on the nervous system."

• **Safety**—"Much safer. Construction operations can progress under bolters that would never be permitted under riveters."

• **Cost**—"Theoretically cost should have been less, but because it was a new technique I am not sure that an actual saving resulted." "Increase in material costs were somewhat more than offset in labor costs and reduction of over-all time required."

• **Strength**—"The ordinary building structure will be no stronger; bridges or structures subjected to dynamic loading will be stronger when high-tensile bolted than riveted." "Tests to date have indicated either as strong a bolt, or in most cases, a stronger bolt than in the equivalent riveted joint. Much is to be done to the codes and design standards to take advantage of the true strength of bolted joints."

Easy-to-Use Aluminum Keeps Insulation Dry

Digested from POWER, Aug, p86

You need suitable materials to protect insulation from the weather. Outdoor installations in power, petroleum and chemical plants have shown aluminum can do the job.

Not only does aluminum weatherproof covering keep insulation dry, it also has these advantages: (1) competitive in cost with conventional coverings, (2) comparatively maintenance free, (3) easier to install, and (4) fire-resistant. Flat sheet is generally selected for covering insulated pipe lines. Corrugated-aluminum roofing is best for covering large storage tanks and pressure vessels.

For covering pipes, sheet is applied from a coil on the site. A hand-operated shear cuts the aluminum and a three-roll former shapes the sheet into a tube. The tubular section is then snapped into place over the pipe and secured with self-tapping aluminum or stainless-steel screws.

For covering tanks, corrugated sheet is hung from angles attached to the tank. Longitudinal seams are lapped and fastened with sheet-metal screws. Expansion-type steel bands secure jacket.

New

Polystyrene foam, up to now, has found application as an insulating material and as a packaging material. Neither application makes use of the foam's high structural strength. But now Emerson Co. (Houston, Tex.) is putting up a house with load-bearing exterior walls of foamed polystyrene. The idea is obvious—one material both supports the roof and insulates the house.

Floors and roof of the house will also contain polystyrene. A 1-inch-thick slab of the material will be bonded to a ½-inch-thick square of marble and laid directly on the concrete slab of this basementless house. The roof will be covered with foam shingles.

Digested from PETROLEUM PROCESSING, Aug, p1101, 1221

WITH

GLOBE Electro-LOADERS

Ramps, stairs, make-shift inclines are eliminated; trucks, trailers, rail cars are conveniently and safely loaded . . . preventing damage and breakage caused by manual lifting . . . when a Globe "Electro-Loader" is used.

Installed at low cost in a few hours . . . indoors or outside . . . in loading areas, storage sheds, beside machines and conveyors . . . on any concrete, wood, or paved surface. Power is supplied by electric motor operating simple cable mechanism.

For permanent, temporary, or portable use. No excavation or special foundation needed . . . only four base plates to anchor. Relocation is fast and easy. Or mounted on casters for complete mobility if desired.

Use the coupon to get all the facts on this modern, easy-to-operate lift.

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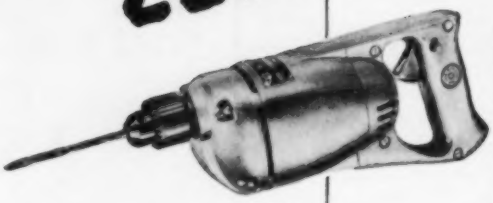
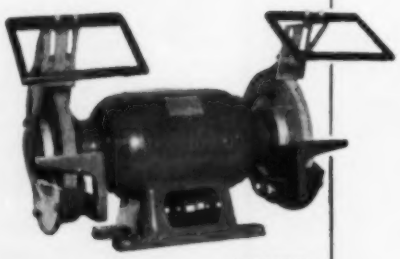
Please send me illustrated data booklet on Globe "Electro-Loaders."
Name
Address
City Country

HAND SHEAR

HITACHI ELECTRIC TOOLS



DRILL



GRINDER

- Electric Drills
- Bench Drills
- Portable Electric Grinders
- Tool Post Grinders
- Bench Grinders
- Portable Electric Saws
- Portable Flexible Disk Sanders
- Adjustable Clutch Nut Runner
- Electric Tappers
- Bench Polishers
- Portable Electric Blowers
- Portable Electric Polishers
- Electric Finishers
- Electric Hand Shears
- Electric Mortisers

FINISHER

DRILL

Hitachi, Ltd.

TOKYO JAPAN

Cable Address: "HITACHY" Tokyo

Europe's Prosperity Raises Inflation Threats...

BRITAIN:
With inflation at home, it lost $136-million from its gold reserves in July.
SWEDEN:
A tight money policy, introduced early this year, is keeping inflation in check.
WEST GERMANY:
Raises rediscount rate to slow expansion, especially in construction.
BELGIUM:
Threat of inflation, coming mainly from outside pressures, leads to higher bank rate.
ITALY:
May follow trend toward higher bank rates, but that won't check inflationary pressure, as economic development of South speeds up.
FRANCE:
Economy is growing but sluggish—seems to run by its own rules; recession may be as big a chance as inflation.
TURKEY:
With no monetary discipline, inflation has got out of hand. Soon it may force devaluation of the Turkish pound.

Inflation: Shadow Over Europe

Digested from BUSINESS WEEK, Aug 13, p26

All the western world, like the U.S., is discovering that prosperity carries with it the seed of its own undoing. The seed is inflation. Three years of steady growth have built up into a boom of production and consumption throughout Europe. The boom lately has been showing signs of inflationary fever.

Tightening of credit has been the Western European remedy thus far. Governments have been applying modern "stabilization techniques." The idea is to restrict credit on the homefront—to curtail demand, consumption, and expansion—and thus ward off the inflationary trend.

Three recent developments, in particular, seem to have led to a tightening of credit:

- Prices of raw materials, including metals, have been rising.
- The construction boom, in nearly every country, has reached unexpected levels, often absorbing labor that could be used more profitably in export industries.
- Labor shortages have been causing trouble. The result has been a kind of black market in wages in West Germany and Britain.

Will credit restraints be strong enough to curb inflation? Money managers throughout Europe hope so. They are optimistic.

West Germany probably has the best chance of solving the inflation problem. During the past 3 years, German retail prices have actually fallen. In contrast, prices have risen substantially in Britain. One of the main reasons for German price stability is that productivity has been rising faster than wages. Meanwhile, Bonn's gold and dollar reserves have been rising steadily.

Two factors might darken this picture: (1) national rearmament and (2) an aggressive drive by German workers for big wage increases.

France poses local problems all its own. To outsiders, the course of France's economy is unpredictable. After 2 years of expansion, it looks as if production might slow down and that France could even be faced with recession rather than inflation!

Two things are fairly clear: (1) France is steadily losing ground in the technological race; and (2) she is very heavily sheltered from outside competition by an array of import restrictions and export quotas.

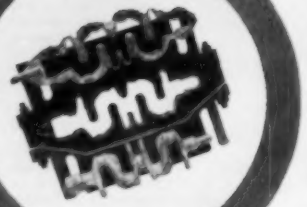
Britain faces a problem more immediately critical than most others. During the first half of 1954, Britain added $500-million to its gold reserves. It had a surplus in over-all trade of £172-million sterling.

But from mid-'54 until mid-'55, imports rose much more than exports. It looks now as if Britain has run at least a small over-all trade deficit. Moreover, during this period, Britain lost about $500-million from gold reserves.

As for inflation, the purchasing power of the pound has declined steadily since July 1945. Its buying power is now 40% lower than at the close of World War II. (See MD, Sept, *Financial Digest.*)

DELORO STELLITE

KEEPS THIS **HOT TRIM DIE** on the job



6 TIMES LONGER

This hot trim die faced with Deloro Stellite, trimmed the flash from over 10,000 crankshafts without serious edge deterioration, 6 times as many as a steel die.

Such success stories are commonplace with Deloro Stellite. Because Deloro Stellite remains hard up to 1850°F., it eliminates many shutdowns and replacements on hot work tooling.

Find out how Deloro Stellite can serve you! Write for your free copy of "375 Ways to Speed Production and Cut Maintenance."

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▶ FINANCIAL DIGEST

The shadow of inflation is visible over the U. S. these days, as well as Europe. A rapid succession of industrial price increases—plus an over-all speculative atmosphere—finally prompted Washington to a plan of action. Object: to slow the boom without killing it.

The Federal Reserve Board acted swiftly. First, it requested that federal housing agencies place limits on the credit available to veterans and other home buyers who use mortgages guaranteed by the government.

Next, the Board directed that the nation's 12 Federal Reserve Banks raise their discount rates—the rates at which they lend money to private banks.

Finally, private lenders were advised to slacken the pace of loans—to curtail speculation.

Success of the tighter credit policy seems reasonably assured—within limits. Meanwhile, there is considerable evidence that the threat of general inflation may be stifled, as it was in 1951-52, simply by the ability of American industry and agriculture to produce ever-greater quantities of the things that people want to buy. High production, after all, may lead the way to stable prices and mark the true defeat of inflation in the U. S.

✦ ✦ ✦

London's stock market has been in a nervous mood lately —afraid the government might announce new anti-inflation measures. But thus far, the fears of investors, brokers and bankers have not materialized.

Chancellor of the Exchequer Butler gave the nation an optimistic report recently—but apparently failed to reassure the skeptics. He said, in his opinion, the recent moves to tighten credit would probably prove successful—if given time. He thought that credit control was a drawn-out process that needed to work its way through the entire economy before results would become apparent.

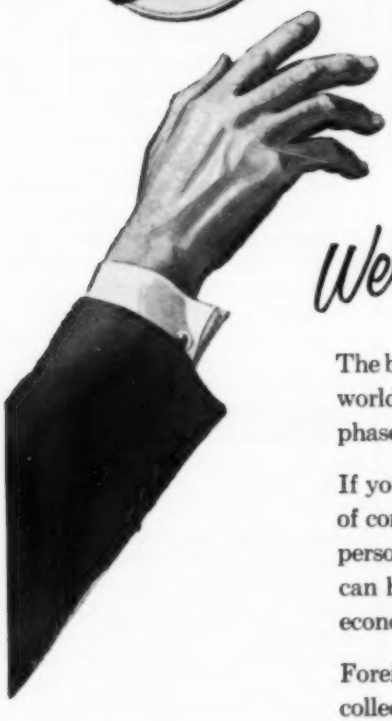
✦ ✦ ✦

Brazilian trade with the sterling area, Germany, and the Netherlands is now developing on a "multilateral" basis. Britain's trade with Brazil—badly depressed in recent years —should increase sharply.

British, Dutch and German traders can now deal freely in German "clearing dollars"—representing inconvertible earnings of Brazilian cruzeiros that can be used for purchases from Brazil.

Exports to Brazil—and imports from Brazil—will be handled under a mutual or "pool" arrangement. In the future, auctions of pounds, deutschemarks, and guilders in Brazil will be made in a single "pool" currency—spendable in the sterling area, Germany, and the Netherlands. Eventually the agreement will be extended to include other nations.

Financial Digest, compiled from various sources, analyzes current financial trends and underlying factors.



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PAPER TAGS attached to retail items can serve a money-making purpose.

Tags Can Help You Sell

Digested from SALES MANAGEMENT, Aug 1, p72

The "right" tag on your product can help you sell the customer—silently, without benefit of a talking salesman. But unless your tag informs, instructs or interests the buyer, you may as well leave it off. It will not help you sell, and retail stores would rather not be bothered with it.

Tags on merchandise should give the potential buyer a sharp, clear-cut reason for buying the product. If what the tag has to say is long and confusing and uninteresting—better forget it. It may do more harm than good. Anyway, the retailer will probably forget it for you, simply by removing it before the item is displayed for sale.

Retailers are also on guard against tags that obviously "oversell" the product. This is a polite way of saying that they do not want tags that mislead the buyer by making false claims.

Aside from attracting the customer, there is another good reason for making the tag interesting and informative—namely, to equip retail sales people with more and better merchandise information. This responsibility the manufacturer too often forgets.

Throw-away tags that inform neither the customer nor the retail salesman, unfortunately, are widely used in the U. S. Here is a typical example of what not to do, direct from a rather elaborate tag: "XYZ Company Brand. Everfresh Fabric, Guaranteed Washable."

There was nothing more printed on the tag! It would not have been too bad had XYZ been a well-known name. But the name meant nothing to the public. Furthermore, what practical information about the article was given? What good is it to say "guaranteed washable" if nothing is said about who makes the guarantee or about the conditions under which the guarantee is made?

Silent selling tags serve both the consumer and retailer. Here is a good example—a tag that helps sell garments made from Cranston's highly wrinkle-resistant material:

"The fabric in this garment has been scientifically improved with the wonder finish—FRESH-TEX by Cranston. . . . Imagine what these permanent features will mean to you: (1) Sheds wrinkles like magic. (2) Washes faster, easier. (3) Needs no starch. (4) Irons flat with one whisk. (5) Resists perspiration odor. (6) Resists mildew in damp weather. (7) Will not shrink any more than 2%.

This fabric can be washed . . . at temperatures not to exceed 150°F. Use any household soap, but avoid the use of chlorine bleaches."

Here is another money-making tag—used by the Nelly Don Dress Co. It gives a quick review of selling points:

"This is one from NELLY DON's series of Suburbanites . . .

- Well-cut, beautifully-tailored casuals that circle the clock—designed for freedom and versatility.
- Excellent fabrics—hand-picked, washable, easy to care for.
- Note faultless workmanship, snap-in shoulder pads, wide finished seams, deep hems.
- Every Nelly Don Suburbanite is cut with dressmaker care on full standard measurements, nothing spared to give good lines.
- For extra waist length in one-piece dresses: Rip top row stitching at waistband; no sewing necessary . . . JUST TRY ONE ON!"

Specific information is given in each case—practical information—directed to the consumer, but packed with knowledge for the salesperson. What better sales-talk could an experienced saleswoman use, for example, than practical, down-to-earth points about dressmaking? And notice that only the manufacturer or someone equally well-informed could possibly supply such accurate detail.

Guard against technical material if you are appealing to the average housewife or casual buyer. But never hesitate to give plenty of easy-to-understand information about the care and use of your product.

Mistakes to Avoid At Trade-Fair Exhibits

Digested from SALES MANAGEMENT, July 1, p60

Guard against these common mistakes made by exhibitors; your trade-fair participation will then mean more profit:

1. Poor planning—Prepare your exhibit well in advance. A makeshift display will hurt your product.
2. Overloaded selling story—Keep written display material as brief and simple as possible.
3. Complicated exhibit—Try to keep your exhibit design from being too involved.
4. Improper identification—Do not let your firm's name dominate the display.
5. Poor maintenance—Arrange for daily cleaning; also smoking stands, hat and coat racks.
6. Inadequate lighting—Employ the same technique you would use in lighting a show window.
7. Unharmonious color—Use pleasant, contrasting colors to emphasize all saleable features.
8. Insufficient illustration—Remember that pictures save many words and tell the story better.
9. Improper booth personnel—Use only your best salesmen.

New

A phonograph "record club" has been started by Columbia Records—first big recording firm to try the idea. The new subscription plan was just announced, after many months of planning.

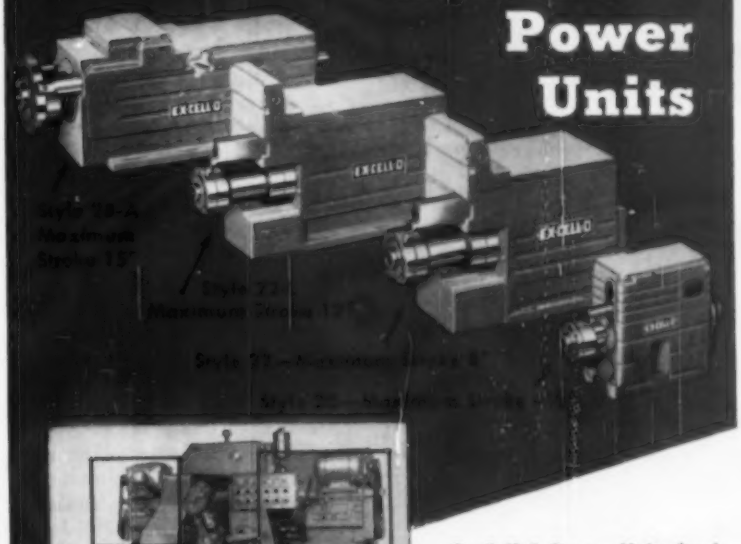
Like the Book-of-the-Month Club, Columbia will send out listings of its recorded classics, show tunes, dance music, and modern-style records. The subscriber will "belong" to any one or more of the four categories. Though he will have a choice of eight records a month, he will be required to buy as few as four a year.

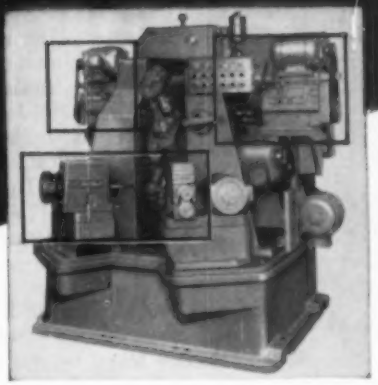
Columbia will urge subscribers to sign up through retail dealers. The dealer will get 20% of the retail price of each record sold to subscribers he contacted.

Digested from BUSINESS WEEK, August 20, p74

For High-Production Machines use....

Ex-Cell-O Quill-Type Hydraulic Power Units





This special machine with automatic indexing fixture core-drills piston pin holes and drills angular oil holes. It uses six Ex-Cell-O Power Units (shown without belt guards) operated from a central push-button station.

Ex-Cell-O Power Units feed and rotate tools in easily controlled automatic cycles. A single tool can be held in the unit spindle or a multiple head can be bolted to the quill flange. The Units are used in low-cost, high-production machines for such operations as drilling, reaming, counterboring and spot-facing. A typical machine consists essentially of a plain base, a work-holding fixture and one or more power units.

Ex-Cell-O Units are self-contained and compact; can be mounted horizontally, vertically with the spindle nose down, or at any angle between these positions. For details about these units write, or cable Ex-Cell-O in Detroit.

EX-CELL-O CORPORATION

Detroit 32, Michigan, U.S.A.

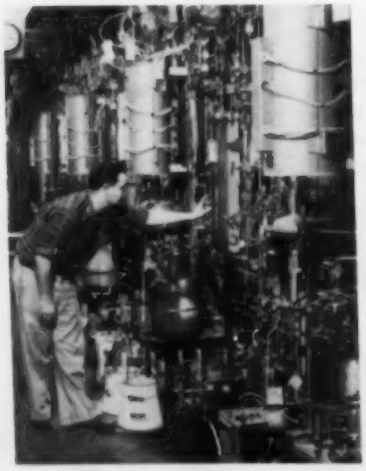
CABLE ADDRESS: XLO, DETROIT, U.S.A.
PRECISION MACHINE TOOLS • CUTTING TOOLS • MACHINES TO PACKAGE MILK IN SANITARY PAPER CONTAINERS.

XLO

55-25

GLASS-BEAD FILTER, at California Research Corp., helps researcher study underground action of oil.

RESEARCH at Esso with radio-active cobalt may lead to faster chemical reactions, possibly new ones.



CATALYSTS, important in petroleum processing, are tested in this Socony Mobil pilot plant.

▶ RESEARCH

Petroleum Research Goals Were Never More Promising

Digested from PETROLEUM WEEK, July 15, p20 & Aug 12, p11

The American petroleum industry, spurred by $150-million for private research this year, faces an exciting new era.

From its research millions, the oil industry wants:

- Better discovery. Direct discovery, the long-time dream, may be a fact in the not-too-distant future.
- Better recovery—getting more oil from known reservoirs.
- Faster drilling to depths that now seem fantastic.
- New refining processes.

All this research points to new and better products for mass consumption. And the oil companies know it's worth the cost.

- **Oil and the Atom**—The atom is easily the industry's most stirring research tool. Esso Research & Engineering Co. (New Jersey Standard) is trying to influence chemical reactions with a radio-active cobalt pipe (McG-H Digest, Feb, p18). The purpose is to speed up reactions already in use and to initiate new reactions.

Atlantic Refining Co. is working to the same end with a 1,000,000-electron-volt resonance transformer. Socony Mobil Oil Co. will use both techniques.

Shell Development Co. has put a 2,000,000-volt atom smasher to work, has ordered a 3,000,000-volt machine. Stanford Research Institute has proposed a nuclear test reactor on a cooperative basis for several industries. Geologists and geophysicists too are working with atomic tools—to find how and why oil is formed. Some clues have been uncovered in sedimentary mud samples from the Gulf of Mexico, Mississippi River, and Venezuela's Orinoco River. The presence of carbon-14 indicates that new oil reservoirs are even now being formed in these beds.

For finding oil directly, a new type of scintillation counter is being tested. It measures the difference in radiation of petroleum hydrocarbons. Also under investigation are methods, with nuclear isotopes, that may detect oil-bearing rock formations.

- **Production Research**—The industry wants more oil from present fields. Humble Refining, for one, spends most of its research time and money on secondary recovery methods.

Heat, even controlled fire, is getting attention as a recovery tool; different techniques look promising. Water- and gas-injection methods are under improvement. One company is trying surfactants, such as soap, to help wash the oil from the sand.

The goal is 100% recovery. It's a long way off. Average recovery in U. S. fields now runs about 50%.

- **Drilling Research**—Deep and fast drilling is getting a lot of study. Among the methods: rotary percussion, sonic, and electric vibratory drills. Also intriguing is jet drilling, in which a tongue of flame, formed by kerosine and oxygen, eats through the rock.

The outlook is deeper and deeper drilling. Oil men think there is oil 50,000 feet down, so they want the drills to find it.

- **Refining Research**—In this field, researchers, besides working with atomic radiation, are studying the potential of thermal diffusion. It's a one-step process for separating crude petroleum into its various streams.

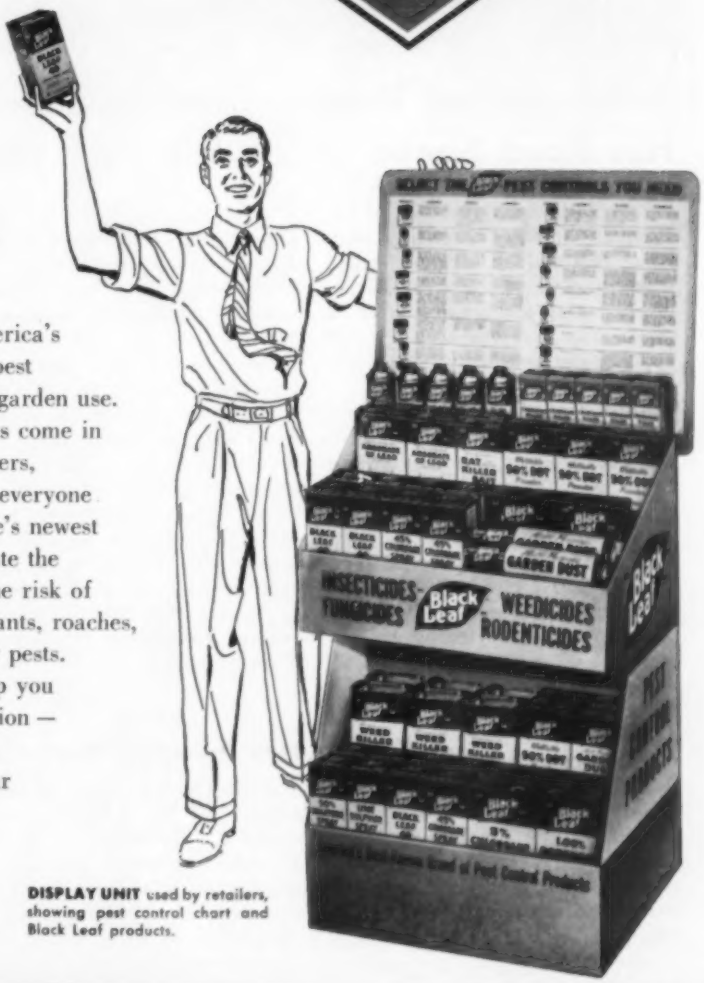
Thermal diffusion may turn out to be more important to petrochemical manufacture than to petroleum refining. It has proved, in pilot-plant tests, especially useful in separating the various members of the xylene family.

But experts disagree on thermal diffusion. One will say: "Most important possibility." Another counters with: "Little more than a laboratory tool." Such disagreement points up why research has become a vital ingredient in successful plant operation.

NOW! Available from Diamond —

Black Leaf Pesticides for the HOME and GARDEN

Black Leaf



DISPLAY UNIT used by retailers, showing pest control chart and Black Leaf products.

Diamond, one of the world's leading makers of chemicals for agriculture, announces its affiliation with Black Leaf, America's oldest and best-known brand of pest control products for home and garden use.

Diamond Black Leaf products come in small packages. Now, homeowners, gardeners, florists, dairymen — everyone may conveniently obtain science's newest insecticides. No one need tolerate the nuisance, the destruction and the risk of disease from flies, mosquitoes, ants, roaches, lice, beetles and countless other pests.

Let Diamond Black Leaf help you enjoy more comfort and sanitation — better living. Write for product information or the name of your nearest supplier.

DIAMOND ALKALI CHEMICALS

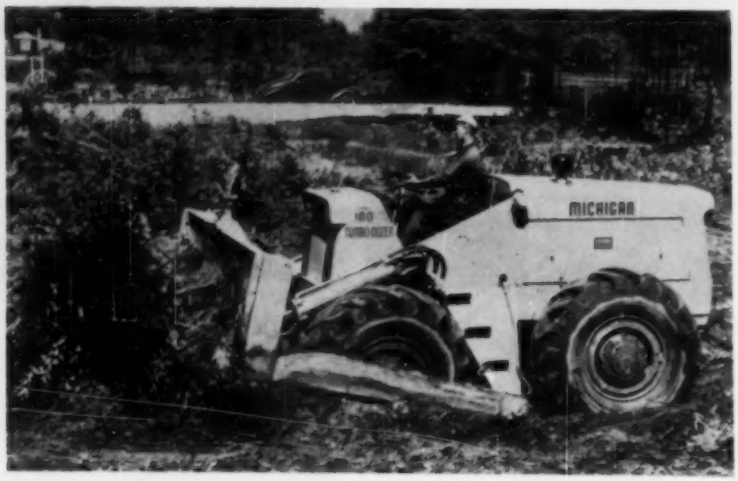
DIAMOND ALKALI COMPANY

Export Sales Division

Room 1612—99 Park Avenue—New York 16, N. Y., U. S. A.

Cable Address: DIAMALKALI

NEW PRODUCTS



Turbocharged, Rubber-Tired Bulldozer Has Road Speed of 27 Miles per Hour

The Michigan Model 180 Turbo-Dozer is the first rubber-tired bulldozer powered by a turbocharged diesel engine. It has a 165-horsepower rating and a capacity of 2¾ yards. The unit has a road speed of 27 miles per hour with four-wheel drive.

Among operational advantages are hydraulic controls that facilitate maintenance, a bowl that can be tilted by the operator while the machine is in motion, and the ability to move under its own power over the highways. The Turbo-Dozer also features a power-shift transmission, a heavy-duty torque converter, and planetary-wheel drive axles.

The 2¾-yard bowl, raised and lowered by two double-acting cylinders, is tipped back and forth by a 6-inch double-acting hydraulic cylinder. It can pry out and lift boulders, uproot stumps, or change the digging angle of the blade from cutting to float position. Both ends of the blade are fitted with vertical cutting edges that enable the Turbo-Dozer to slice through heavy roots before knocking over trees.

Quick starting, even at extremely low temperatures, is facilitated by a 24-volt electrical system. Four 18.00x25, 12-ply high flotation tires and a wheel tread of 6 feet 11 inches give the Turbo-Dozer good traction. Rear-wheel steering increases tire life.

The dozer has vacuum-power-boosted four-wheel brakes for service use and two-wheel mechanical brakes, connected to service brake shoes in the front wheels, for parking. A 50-gallon fuel tank permits it to work an average full day without refueling. A swinging drawbar fastened to the center of the dozer's heavy-duty frame, well below the center line of the wheels, allows fast, easy connection to any piece of equipment that has to be pulled. **(Clark Equipment Co., Benton Harbor, Mich.)**

●

New Induction Heater

A 30-kilowatt induction heater, either totally enclosed water-cooled or open air-cooled, includes all elements needed for induction heating. Coils for the specific applications can be combined and adapted to fit a multitude of induction heating jobs. Thirty-two standard combinations make the unit ideal for hardening and heating operations, metal-joining, hot-heading, and forging. **(Westinghouse Electric International Corp., 40 Wall St., New York 5, N. Y.)**

Welds Small Parts

Suitable for operation with most types of resistance welding controls, model J welding head is designed for rapid, precision welding of small parts. It is particularly useful in molding miniature parts.

The model J is easy to install and requires little bench area. It produces uniformly strong, clean spot welds at high speeds. **(Raytheon Mfg. Co., 589 5th Ave., New York 17, N. Y.)**

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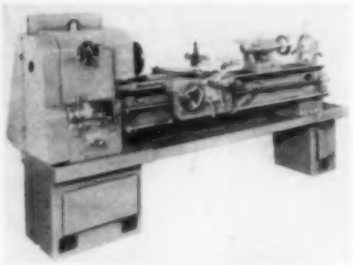


Low-Cost Engine Lathes

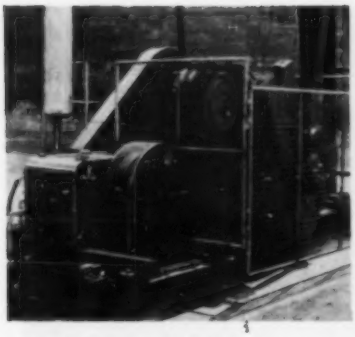
New all-geared head, Model LE "Tray-Top" engine lathes provide the metalworking industry with modern, low-cost equipment for manufacturing, maintenance, and toolroom use. The lathes are available in 10-, 12½-, 15-, and 18-inch sizes and are equipped with a 1-, 1½-, 2-or 3-horsepower motor.

The lathes have 12 spindle speeds in geometric progression with a three-lever, color-match, direct-reading shift mechanism. The spindle is mounted in three precision anti-friction bearings. **(Cincinnati Lathe & Tool Co., Cincinnati, Ohio.)**

●

Tool Grinders

Four models ranging from precision grinders with 6-inch wheels to heavy-duty machines with 14-inch wheels comprise a new line of tool grinders. All are double-end models with reversible motors for proper wheel rotatoin for both left- and right-hand tools. The grinding is done on the faces of plate-mounted wheels, resulting in straight surfaces and accurate tool angles. **(Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.)**



New Engine Will Run Year Without Service

A 20 brake-horsepower, 2-cylinder engine, MM Timeline 168, is designed to run continuously for a year without service. A totally new radial cooling system replaces the conventional radiator. Also eliminated are water pump, pulleys, fan, fan belt, and radiator hoses. Water is circulated through a cast-aluminum cooling unit built into the flywheel. **(Minneapolis-Moline Co., Minneapolis 1, Minn.)**

•

Plastic Safety Helmet

New plastic safety helmet, is designed to offer extra protection in what has been described as the "danger zone"—the front, top, and back areas of a hat most often exposed to impact. The new Skullgard incorporates a special reinforcement in these areas.

The Skullgard is high-pressure molded in one piece from hard, smooth, laminated plastic. Rounded contours and strength of the helmet provide effective deflection of falling or flying objects and offer protection against bump hazards for men working in close quarters. **(Mine Safety Appliances Co., 200 North Braddock St., Pittsburgh 8, Pa.)**

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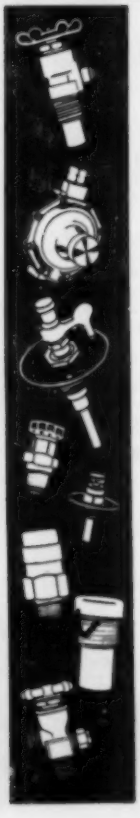

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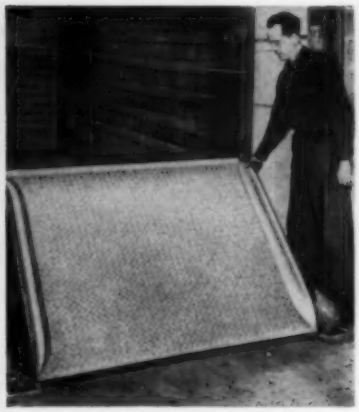

Magnesium Dock Board

A new magnesium-dock-board loading system, designed for permanent installation on concrete docks, is easily raised or lowered by one man. The dock-board units, called Perma-Docks, require no power operated devices or counterbalances. The recessed type of dock installation permits the dock-board unit to self-adjust to truck level and automatically compensate for truck-spring deflection. **(Magline Inc, Pinconning, Mich.)**

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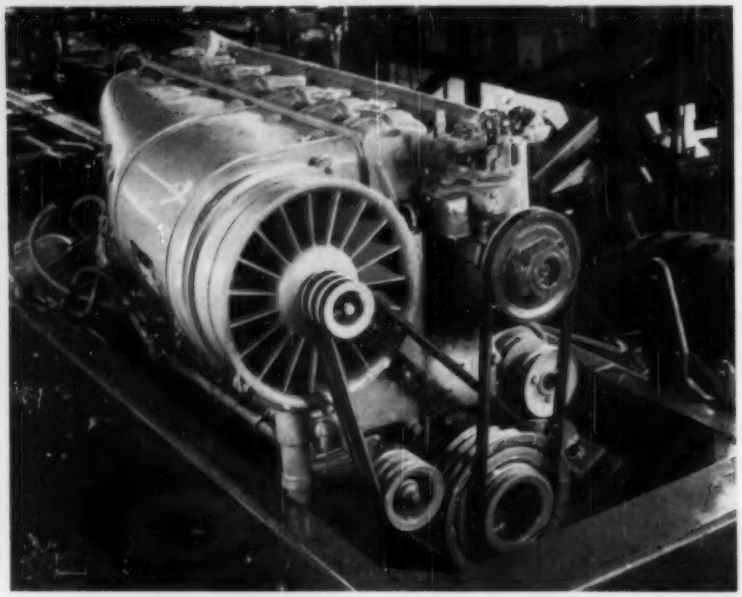

New Air-Cooled Diesel-Engine Line Provides Wide Power Range, Flexibility

The new Deutz line includes 1- to 12-cylinder air-cooled diesel engines that develop from 15 to 150 horsepower. The 2- to 6-cylinder units are in-line design, and those with 8 to 12 cylinders are the V-type. The 6-cylinder model is available in both. Most adaptable for truck use are the 3- to 8-cylinder units. Other units can drive generators, boats, pumps. The first powerplant developed in the line was the 4-cylinder model FL4 514. This was followed by the other models, which differ in number of cylinders but are alike in that they use the same cylinders, cylinder heads, and pistons. All rod assemblies are identical in the in-line engines. The V-engines also use interchangeable rods. They all have the same bore, 4.3307 inches; the same stroke, 5.5118 inches; and the same capacity, 81 cubic inches.

An axial-flow blower cools the engine. Air is delivered at high velocity through air ducts and past the fins of the cylinders and cylinder heads. The air ducts can be opened by removing two plate covers. The cooling air blower is driven from the timing gear end through a shaft and flexible coupling.

The engine is lubricated by a gear-type oil pump driven from the front-end crankshaft gear. It draws oil through a strainer from the middle of the oil pan and delivers it to the oil cooler through a pipe in front of the crankcase cover. After the oil passes through the filter, it flows into the oil main and the upper crankcase. One part of the oil flows to the main bearings and through the oil holes drilled in the crankshaft to the large end bearings, while the other part flows through the first camshaft bearing, then to the valve tappets.

The fuel filter is located between the fuel-feed pump and injection pump. The fuel is delivered by the feed pump into the space around the filter element. From there it percolates through the layers of the filter element and passes through the discharge pipe to the injection pump. All models are equipped with the Bosch-type injection system. **(Klockner-Humboldt-Deutz AG, Koln, Germany.)**

Safety Shut-Off

Black, Sivalls and Bryson has equipped its regular line of diaphragm control valves with a delatching trip mechanism. Here's how it works: If the valve is moved to a safe open or closed position because of some failure in the system, it can be thrown into service again by manually setting its latching lever. The mechanism should see excellent use as a pressure-loss pipeline shut-off or as a safety shut-off on fuel lines. Operation is completely automatic. **(Black, Sivalls & Bryson Inc., 7500 East 12th St., Kansas City, Mo.)**

●

Projection Lens

This new 16-millimeter lens will make it possible for thousands of small theatres throughout the world, military bases, industrial plants, clubs, and institutions to show CinemaScope productions, using standard 16-millimeter sound projectors.

The CinemaScope lens will double the screen width of regular 16-millimeter films when they are projected from the same distance.

The new lens combines a regular projection lens with the CinemaScope lens in one unit. The operator simply removes the regular lens and inserts the CinemaScope lens and adapter. **(Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.)**

NEW COMPONENT BRIEFS

Ground Thread Collets—To give the utmost in precision, durability and smooth, easy operation, a new line of precision collets with heat-treated and form-ground precision thread has been developed. "Red Arrow" collets are available for all current models of South Bend lathes. **(South Bend Lathe Works, South Bend 22, Ind.)**

●

Fork-truck Attachment—A wide variety of carton and crate handling jobs can now be accomplished with a new versatile hydraulic clamp with rotator and side shifter. The clamp handles crates, capped cartons, and regular cartons in a great range of sizes. **(Yale & Towne Mfg. Co., Roosevelt Blvd., Philadelphia 15, Pa.)**

●

Tinless Solder—A new tinless, organic solder shows promise of relieving the container industry of its dependence on tin. The new bonding agent has excellent adhesion to plain metal. **(Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass.)**

●

Ball-bearing Unit—The Sealmaster two-bolt flange ball-bearing unit is available in shaft sizes from ½ to 2⅞ in. The two-bolt flange design allows for closer bearing spacing on multiple shaft installations.—**Stephens-Adamson Mfg. Co., Aurora, Ill.**

●

Oil-filter Cartridge—Kleer-Pac, a new depth-type oil filter, is recommended for efficient, low-cost filtration of engine lube oils, hydraulic oils, turbine oils, quench oils, and cutting and grinding oils. **(Houdaille-Hershey of Indiana, Inc., Lebanon, Inc.)**

●

New Base-polymers—Two new base-polymers or "gums" for silicone rubber stocks have now been made available. Identified as Silastic 400 Gum and 440 Gum, they offer greatly reduced compounding time and increased temperature stability of compounded stocks. **(Dow Corning Corp., Midland, Mich.)**

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Please write directly . . .

. . . to the manufacturers for the free literature announced on this page. Tell them definitely which catalog you want—specify the catalog number or its name when either one is given. And mention that you saw the offer in MANAGEMENT DIGEST.

Pumps—Bulletin W-414-B21 offers information on water supply pumps, injection and disposal pumps. Various photographs illustrate testing warehouse facilities and oil and water field installations.—Worthington Corp., Harrison, N. J.

Earthmover—Booklet DE514 contains contractors' reports on their experience with an earthmoving unit that gives them low cost per yard over the entire life of the machine. — Caterpillar Tractor Co., Peoria, Ill.

Electric Motors — Catalog GEC-1026 presents complete buying information on standard alternating-current fractional and integral horsepower motors. Information includes ratings, dimensions, weights.—Intl. General Electric Co., 570 Lexington Ave., New York 22, N. Y.

Bronze Valves—Complete information on bronze valves for the plumbing and heating industry is given in catalog B255. Catalog covers 55 types of valves in a variety of sizes.—Milwaukee Valve Co., 2375 S. Burrell St., Milwaukee, Wis.

Liquid-level Gages — Bulletin L701 describes the complete line of liquid-level gages for indicating, recording, controlling, and telemetering.—Bristol Co., Waterbury 20, Conn.

Sheaves—Stationary and motion control "Vari-Pitch" sheaves for speed variations up to 76% by means of pitch-diameter adjustment are described in bulletin 20B6082C. —Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Casters and Wheels—Catalog describes the complete line of Rapistan casters and wheels for light through heavy-duty use on all types of portable equipment.—Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.

Two-way Radio—Bulletin 3J2540 tells how RCA two-way radio control cuts materials-handling costs. —Radio Corp. of America, Intl. Div., 30 Rockefeller Plaza, New York 20, N. Y.

Hand Truck — Complete information on the STAIR CART, a ruggedly built hand truck designed to allow heavy loads to be easily rolled up and down stairways, is given in bulletin KEV 25M.—Valley Craft Products Inc., 750 Jefferson, Lake City, Minn.

Industrial Television—The advantages of the "UtiliVue" 400, a versatile, closed-circuit television camera, are given in bulletin 1175A.—Diamond Power Specialty Corp., Lancaster, Ohio.

Engine Gear Unit—Bulletin 237 describes the advantages of the Nordberg Supairthermal V-type engine-gear set for operation on large-capacity gas pipe lines.—Nordberg Mfg. Co., Milwaukee 1, Wis.

Batteries—Bulletin CP-538/55 covers the new line of Hi-Power batteries for use in the control, switchgear, emergency lighting and auxiliary power fields.—C & D Batteries Inc., Conshohocken, Pa.

Portable Air Compressor—Bulletin 2302 contains complete information on the 3R-36 cfm self-contained portable compressor.—Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Thermoplastic Insulation—The ten properties of Thermoplastic insulation that extend the life of generators, synchronous condensers, frequency changers, large motors, and other heavy rotating equipment are discussed in booklet B-6506.—Westinghouse Electric Intl. Corp., 40 Wall St., New York 5, N. Y.

Pumps—Type BFI boiler feed pumps for high-pressure service are described and illustrated in bulletin 122.—Pacific Pumps Inc., Huntington Park, Calif.

Tractor-shovels—The design construction, and operation of the all-wheel drive Michigan model 175-A and the smaller model 125-A tractor shovel are completely described in catalog 1250-P.—Clark Equipment Co., Benton Harbor, Mich.

Fork-truck Attachment—A unique, hydraulic clamp attachment designed to handle a variety of loads without the use of pallets or skids is detailed in new Truck Engineering Bulletin.—Elwell Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.

Sewage Treatment—Bulletin 6262 describes the development, equipment, operation, and typical applications of the Dorrco Densludge Digestion system. Dorr-Oliver Inc., Barry Place, Stamford, Conn.

Air Diffusers—Detailed information on Kno-Draft high-pressure air diffusers is given in bulletin K-33. Selection charts permit the engineer to select the proper high-pressure diffuser for any application.—Connor Engrg. Corp., Danbury, Conn.

Press Rebuilding—Bulletin 47 tells how the E. W. Bliss Co. is able to rebuild a press at a fraction of its original cost and yet give it the same guarantee as a new press.—E. W. Bliss Co., 1375 Raff Rd. S. W., Canton, Ohio.

Bagging Scale—Bulletin 3794A describes and illustrates the E-50 automatic bagging scale designed for high-speed bagging with consistent weighing accuracy.—Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Stabilizing Vinyl Resins—Materials and methods for stabilizing vinyl resins are described in bulletin, "Witco Stayrites." For your copy, write on your company letterhead.—Witco Chemical Co., 122 E. 42nd St., New York 17, N. Y.

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Publisher

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330 W. 42nd St., New York 36, N. Y.
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Aviation Week
Business Education World
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Bus Transportation
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Chemical Week
Coal Age
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Electrical Construction & Maintenance
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Petroleum Week
Power
Product Engineering
Textile World
The American Automobile (Overseas Edition)
Today's Secretary

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Banking

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American Business

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191 W. 40th St., New York 18, N. Y.
Architectural Record

The Economist Newspaper, Ltd.,
22 Ryder St., London S.W. 1, England
The Economist (London)

Fritz Publications, Inc.
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The Paper Industry

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Harvard Business Review

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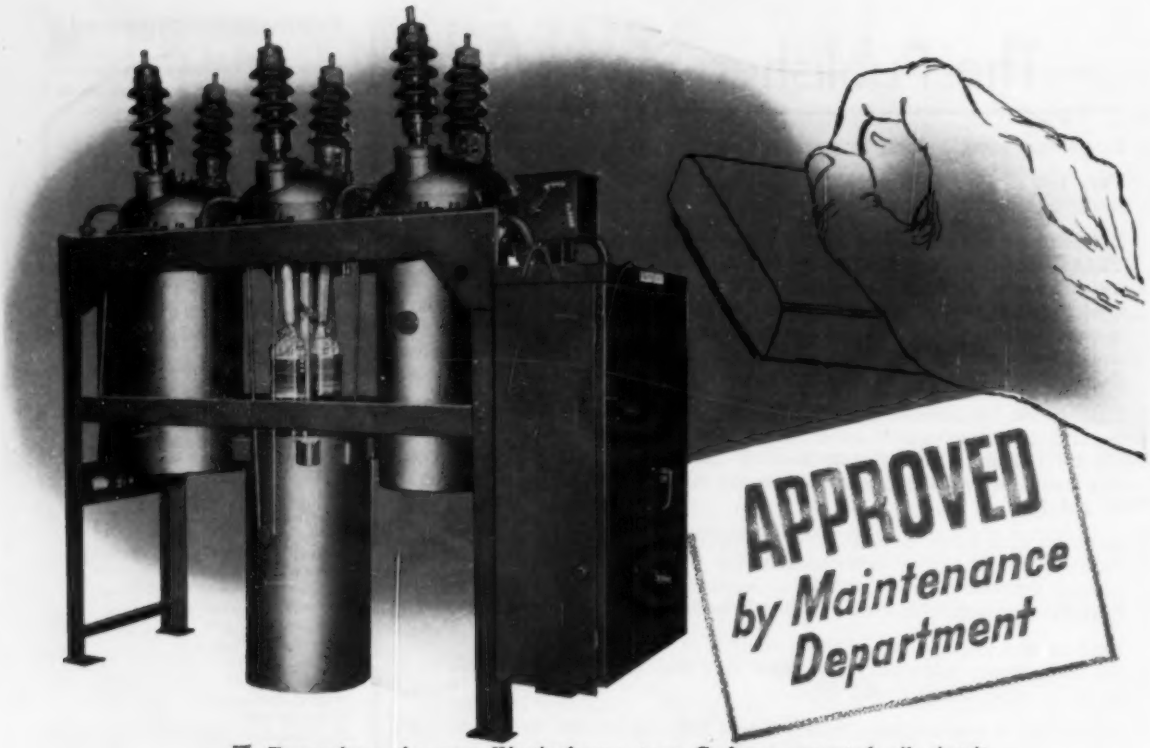

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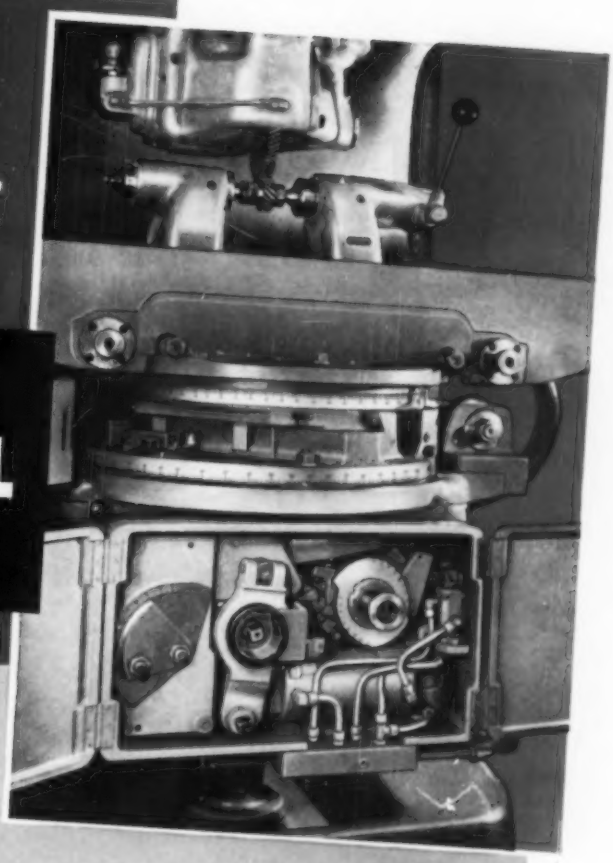

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